TRAVAUX DU MUSÉUM NATIONAL D'HISTOIRE NATURELLE «GRIGORE ANTIPA»

THE JOURNAL OF "GRIGORE ANTIPA" NATIONAL MUSEUM OF NATURAL HISTORY

Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 67 (2): 183–234 (2024)
doi: 10.3897/travaux.67.e112517

RESEARCH ARTICLE

Systematics of the Western Ghats endemic tarantula subfamily Thrigmopoeinae with the description of a new genus and four new species

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Received 11 September 2023 | Accepted 20 February 2024 | Published 31 December 2024

Citation: Mirza Z (2024) Systematics of the Western Ghats endemic tarantula subfamily Thrigmopoeinae with the description of a new genus and four new species. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 67(2): 183–234. https://doi.org/10.3897/travaux.67.e112517

Abstract

The Western Ghats are a biodiversity hotspot known for its high degree of endemism. The tarantula subfamily Thrigmopoeinae, with two genera and seven species, is endemic to the Western Ghats. A taxonomic account of the Western Ghats endemic tarantula subfamily Thrigmopoeinae is presented. The study is based on a re-examination of existing museum material and a fresh collection from across the Western Ghats. Rediagnosis of the genera *Haploclastus* Simon, 1892 and *Thrigmopoeus* Pocock, 1899, is presented with a description of a new genus and four new species. The genus *Cilantica* gen. nov. is proposed to accommodate *Cilantica phsycadelicus* **comb. nov.** and *Cilantica kayi* **comb. nov.**, and a new species from the southern Western Ghats. Thrigmopoeinae, being endemic to the Western Ghats, a biodiversity hotspot, is a vital flagship for invertebrate conservation.

Keywords

biogeography; conservation; India; natural history; taxonomy; Theraphosidae; Western Ghats

Introduction

The Western Ghats are a mountain chain which runs parallel to the western coast of India for ca. 1600 km and are about 30km wide, starting from the southern tip of Gujarat state through Maharashtra, Goa, Karnataka and terminating in southern Tamil Nadu (Mani 1974, Biju and Bossuyt 2009). Across its length, the Western Ghats

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received heavy rain from the southwest monsoon winds, which shape its topology and support diverse flora and fauna (Biju and Bossuyt 2005, Biju et al. 2009). The Western Ghats, also known as "Sahydri Hills", is a biodiversity hotspot which supports a high degree of endemic fauna (Myers et al. 2000, Biju and Bossuyt 2003, Giri 2008, Pal et al. 2021, Patel et al. 2023). Only recently, there has been increased attention towards documentation of invertebrates (Molur et al. 2011, Reid et al. 2013) and spiders in this region, which have resulted in the discovery of numerous new taxa (Mirza and Sanap 2012, Mirza et al. 2012, 2014, Siliwal et al. 2012, Prasanth and Jose Suni 2014, Sanap and Mirza 2014, Mirza 2023).

Theraphosidae is the most species-rich family among mygalomorphae, with ~159 genera and 1066 species (World Spider Catalog 2023). This apparent speciose status appears to be due to the fact that theraphosids are well documented as opposed to other mygalomorph spiders like trapdoor spiders, which are poorly documented as they are hard to detect during regular surveys (Javed et al. 2010, Sanap and Mirza 2011, Mirza et al. 2014). Despite the popularity of tarantulas worldwide, the diversity of these large spiders remains poorly documented in India (Sebastian and Peter 2009, Mondal et al. 2020), which is evident from the description of two new genera and nine new species in the recent past (Siliwal et al. 2012, Mirza et al. 2014). India is home to about 60 species in 13 genera under six subfamilies (Mirza et al. 2014). Of the six subfamilies reported from India, Thrigmopoeinae is represented by two genera (*Haploclastus* Simon 1892 and *Thrigmopoeus* Pocock 1899) and nine species which are endemic to Western Ghats (Pocock 1900, Mirza et al. 2011, Sanap and Mirza 2014). The genus *Phlogiodes* Pocock 1899 was synonymised with *Haploclastus* by Raven (1985), and Mirza & Sanap (2013) made attempts to revalidate the genus, which was, however, not followed by subsequent authors (Prasanth and Jose Suni 2014, World Spider Catalog 2023) as the authors did not support their claim using cladistic or molecular data. The taxonomy of this subfamily remained unattended, and most species are still known only from their type locality and type specimens. Exceptions to these include publications by Siliwal & Raven (2010), Siliwal et al. (2009), Mirza et al. (2011) and Prasanth & Jose (2014).

A recent arachnological expedition and a re-examination of museum material collected from the Western Ghats enables me to present a comprehensive revision of members of the subfamily Thrigmopoeinae. As a result of the revision, I am able to describe four new species and rediagnosis of known genera. Furthermore, the paper also brings to light the diversity of members of the subfamily Thrigmopoeinae, which can serve as a flagship species for invertebrate conservation in the Western Ghats.

Materials and Methods

Specimens were collected during the surveys conducted in Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala between 2010–2021. Types are deposited at the Bombay Natural History Society, Mumbai, Maharashtra. Comparative material

for the study was examined from the collection of the Natural History Museum (NHMUK), London, Zoological Survey of India (ZSI), Kolkata, Muséum national d'histoire naturelle (MNHN), Paris, and University of Copenhagen, Zoological Museum (ZMUC), Denmark. Measurements of body parts were taken with Mitutoyo™ Dial Caliper. Measurements of the chelicerae have been taken of the lateral aspect after dissection. All measurements are in millimetres, and the total length excludes chelicerae length. Spermathecae were dissected and cleaned in clove oil using needles. Specimens were examined using Olympus SZ42 stereo-binocular microscope. Photographs of the specimens in India were taken with a Canon 70D mounted with a Canon 100mm macro, and those at the Natural History Museum were taken with an imaging system on Leica MZ12S. Descriptive style follows the standardised descriptive style provided by Mirza et al. (2014). Habitat and forest-type data follow the classification provided by Champion and Seth (1968). Data for *Cilantica phsycadelicus* comb. nov., *Haploclastus validus* and *Thrigmopoeus truculentus* have been derived from Sanap & Mirza (2014), Mirza & Sanap (2013) and Siliwal et al. (2009), respectively.

Abbreviations:

ALE – Anterior lateral Eyes; AME – Anterior Median Eyes; BNHS – Bombay Natural History Society, Mumbai; d – dorsal; fe – femur; ICZN – International Code for Zoological Nomenclature; MNHN –Muséum national d'Histoire naturelle; mt – metatarsus; MOQ – Median ocular quadrate; NHMUK – Natural History Museum, London; p – Prolateral; pa – patella; PLE – Posterior lateral eyes; PLS – Posterior lateral spinnerets; PME – Posterior median eyes; PMS – Posterior median spinnerets; r – retrolateral; ta – tarsus; ti – tibia; v – ventral; WILD – Wildlife Information Liaison Development Society, Coimbatore; ZM – Zeeshan Mirza; ZSI – Zoological Survey of India, Kolkata.

Nomenclature acts:

The electronic edition of this article conforms to the requirements of the amended International Code of Zoological Nomenclature. Hence, the new names contained herein are available under that Code from the electronic edition of this article. This published work and the nomenclatural acts it contains have been registered in ZooBank, the online registration system for the ICZN (1999). The ZooBank LSIDs (Life Science Identifiers) can be resolved and the associated information viewed through any standard web browser by appending the LSID to the prefix "http://zoobank.org/". The LSID for this publication is: urn:lsid:zoobank.org:pub:D32454F1-24C0-45F7-88EC-1B40E12BD162. The electronic edition of this work was published in a journal with an ISSN, and has been archived and is available from the following digital repositories: PubMed Central, LOCKSS.

Material examined:
Annandaliella travancorica Hirst, 1909 holotype female (NHMUK 16.5.2.13) Travancore, Kerala, India
Batesiella crinita Pocock, 1903 holotype female (NHMUK 1903.6.30.23) Cameroona, Africa
Chilobrachys furmosus (Pocock 1895) holotype female (NHMUK 09.10.7.17), North India
Eumenophorus murphyi Smith, 1990 female (NHMUK 4859) Sierra Leone
Euphrictus spinosus Hirst, 1909 holotype male (NHMUK 1908.8.11.2), River Ja, Cemeroonsm Africa
Haploclastus cervinus Simon, 1892 holotype immature MNHN (AR 4711) 9800 Kodaikanal, Tamil Nadu
Haploclastus kayi Gravely, 1915 female holotype from ZSI
Haploclastus nilgirinus Pocock, 1899 NHMUK 94.8.21.9, female holotype
Haploclastus tenebrosus Gravely, 1935 Diagrams of male holotype from ZSI (specimen missing)
Heterophrictus milleti Pocock, 1900 female, Nashik District, Maharashtra, India
Heterophrictus blatteri (Gravely, 1935) female (NHMUK 16.5.2.15) Satara district, Maharashtra, India
Hysterocrates sp. female (NHMUK 79.49)
Monocentropus sp. female (NHMUK 1903.9.2.29)
Plesiophrictus bhori Gravely, 1915 female (NHMUK 16.5.2.16) Parambikulam, Kerala, India
Plesiophrictus collinus (Pocock, 1899) holotype female (NHMUK 19.16.29) Yercaud in Shevaroy Hills, Tamil Nadu, India
Plesiophrictus millardi Pocock, 1899 male (NHMUK 99.11 2.234) Matheran, Raighad District, Maharashtra, India; topotype male BNHS SP-62, Matheran, Raighad District, Maharashtra, India
Plesiophrictus satarensis Gravely, 1915 holotype male (NHMUK 22.05.17), Medha, Yenna Valley, Satara District, Maharashtra, India
Plesiophrictus sericeus Pocock, 1900 holotype female (NHMUK 99.9.21.161) Eastern Pune, Pune District, Maharasshtra, India
Phlogiodes robustus Pocock, 1899 female holotype NHMUK, registration number not available
Phlogiodes validus Pocock, 1899 1 male, Matheran, Raighad District, Maharashtra WILD-10- ARA-1102; 1 female, Matheran, Raighad District, Maharashtra WILD-10-ARA-1103; 1 male, Aarey Milk Colony, Mumbai, Maharashtra
Selenogyrus austinius Smith, 1990 holotype female (NHMUK 1896.11.15.5), Sierra Leone, Africa
Selenogyrus caeruleus Pocock, 1897 holotype female (NHMUK 1896.12.20.21) Sierra Leone, Africa

Results

Systematics
Family Theraphosidae Thorell, 1869
Subfamily Thrigmopoeinae Pocock, 1900
Thrigmopoeinae Pocock, 1900: 178, 184; Raven, 1985: 117

Diagnosis: Retrolateral face of chelicerae with cluster of thick curved paddle setae at the base of oral fringe or parallel rows of thick bristles or lanceolate setae on basal oral fringe acting against thick long or short bristles arranged in a 'C' shaped band or a diffused manner on the prolateral face of maxilla. Coxa of all legs lacking stridulatory setae.

Type genus: *Thrigmopoeus* Pocock, 1899

Included genera: *Cilantica* **gen. nov.**; *Haploclastus* Simon, 1892; *Thrigmopoeus* Pocock, 1899

Distribution: Western Ghats of India (Fig. 1)

Key to genera of Thrigmopoeinae

1 – Retrolateral basal oral fringe of chelicerae with lanceolate setae ..... *Haploclastus*
– Retrolateral basal oral fringe of chelicerae with curved modified setae *2*

2 – Prolateral face of maxilla with stridulatory setae arranged in a 'C' shaped manner ..... *Thrigmopoeus*
– Prolateral face of maxilla with stridulatory setae are diffused and not arranged in a 'C' shaped manner ..... *Cilantica* **gen. nov.**

***Cilantica* gen. nov.**
Haploclastus Gravely, 1915: 278 (in part)
Thrigmopoeus Sanap & Mirza 2014: 481
LSID: urn:lsid:zoobank.org:act:FA2A9516-6711-4CD8-BD39-897158C1AE89

Type species: *Cilantica agasthyaensis* **sp. nov.**

Species included: *Cilantica agasthyaensis* **sp. nov.**, *Cilantica kayi* (Gravely, 1915) **comb. nov.**, *Cilantica phsycadelicus* (Sanap & Mirza 2014) **comb. nov.**

Diagnosis: Fovea shallow, procurved. Posterior sterna sigilla not very deep, and posterior sigilla sub-centrally placed. Retrolaeral face of chelicerae with parallel

rows of thick curved modified setae. Prolateral face of maxilla with stout thorns of long black bristles arranged along the maxillary suture line below and above it in a diffused manner. Spines present on legs II–IV. Spermathecae in the shape of mounds. Females hold egg sac under chelicerae.

Etymology: The proposed generic name is Latinized noun "Cilanti" (சிலந்தி), a Tamil word for spider. The generic name is masculine in gender.

Figure 1. Distribution records for tarantulas of the endemic subfamily Thrigmopoeinae based on literature records.

Description – Large sized spiders 25–38. Carapace ovate, hirsute, with two clear (setae-less) bands on both sides of the caput. Caput low in females. Fovea procurved, not straight. Eye group sub-quadrate to wider than long, ocular tubercle well defined. Clypeus narrow. Chelicerae normal, with 11–15 teeth on promargin of furrow, basomesally 40–50 small teeth. Labium wider than long. Labiosternal grove with two distinct mounds. Cuspules 120–130 in the sub-apical region of the labium. Maxillae longer than wide, overall setose, prolateral anterior angle distinctly produced, 8–120 cuspules distributed along proximal prolateral angle. Serrula absent. Sternum as long as wide, sigilla small oval, submarginal, posterior sigilla sub-centrally placed, not deep. Prolateral face of maxilla in females with stout thorns arranged below and above maxillary suture in a diffused manner and not in a 'C' shaped manner. Legs moderately stout, hirsute, spines present on leg II–IV. Abdomen hirsute, without pattern. PMS well-developed; PLS, apical segment digitiform. Spermathecae with two individual receptacles in shape of mounds.

Comparison: *Cilantica* **gen. nov.** is similar to *Thrigmopoeus* with which it shares presence of a cluster of curved modified setae on retrolateral oral base and shape of spermathecae. It differs from *Thrigmopoeus* as in having stridulatory setae on prolateral face of maxilla present in a diffused manner and not in a well defined "C" shaped band and in bearing spiders on leg I–IV. Differs from *Haploclastus* in lacking lanceolate setae on retrolateral face of chelicerae and in having mound shaped independent spermathecae.

Additional notes: Members of the genus are presently known only south of Palghat Gap in the Indian state of Kerala. The burrow is mostly seen on mud walls and embankments along streams with a clear tubular extension made up of soil and leaves or other surrounding material. Females of *Cilantica agasthyaensis* **sp. nov.** at two localities were observed holding the egg sac under the chelicerae.

Key to species of the genus *Cilantica* gen. nov.

1 – Adult in a shade of dark brown to black with blue luster on carapace and abdomen, species exhibiting dichromatic morphs with respect to maturity ..... *Cilantica phsycadelicus* **comb. nov.**
– Adults in shade of brown to gray lacking metallic blue lustre 2

2 – Anterior maxillary lobe moderately pronounced, gradually tapering into a cone, lacking a basal constriction, anterior border of anterior eyes on the same plane/level, spines on leg I present ..... *Cilantica kayi* **comb. nov.**
– Anterior maxillary lobe distinctly pronounced, abruptly tapering into a cone from a basal constriction, ALE and AME not in the same plane/level, spines on leg I absent ..... *Cilantica agasthyaensis* **sp. nov.**

***Cilantica agasthyaensis* sp. nov.**
LSID: urn:lsid:zoobank.org:act:09A34D1A-1328-4F6C-8713-88B89E054CCA
(Figs 2–5, Table 1)

Holotype- female BNHS SP 125, on the way to Pandipat hut from Bonacaud, Peppara Wildlife Sanctuary, Kerala state, India (8.672863°, 77.150788°, elevation 350m), collected by Rajesh Sanap and Zeeshan Mirza on 24th December 2013; paratype female from the same locality BNHS SP 126; female BNHS SP 127 from Ponmudi, Kerala (8.760796°, 77.118420°, elevation 860m). Same collectors. Date 21st December 2013.

Diagnosis: A small sized spider reaching a total length of 23mm. Overall in a shade of grayish brown with a distinct rusty red tinge, legs femur dark brown and distal segments paler. Chelicerae with 11 promarginal and nearly 40 small basal granules. Maxillary lobe distinctly pronounced, abruptly tapering into a cone from a basal constriction. Anterior border of ALE closer to the clypeus than the anterior border of the AME. Spines on leg I absent. Spermathecae with two seminal receptacles in shape of short mounds separated by a small gap much less than their widths.

Etymology: The species is named after Agasthyamalai hill range in Southern Western Ghats.

Comparison: *Cilantica agasthyaensis* **sp. nov.** differs from *C. kayi* **comb. nov.** and *C. phsycadelicus* **comb. nov.** in bearing a basal constriction at the base on anterior maxillary lobe (absent in *C. kayi* **comb. nov.** and *C. phsycadelicus* **comb. nov.**); spines on leg I absent (vs. present in *C. kayi* **comb. nov.**).

Description of holotype female BNHS SP125 (Figs 2, 3): carapace 13.4 long, 11.1 wide (L/W ratio 1.2), chelicerae 8.4 long. Sternum 6.7 long, 5.6 wide (L/W 1.2). Abdomen 12.8 long, 9.3 wide (L/W 1.4). Spinnerets: PMS, 1.6 long, 0.9 wide, 0.4 apart; PLS, 2.2 basal, 1.4 middle, 2.5 distal; midwidths 1.5, 1.3, 1.0 respectively, apart 1.5.

Colouration (Figs 2, 3): overall in a shade of grayish brown with a rusty red tinge, legs femur dark brown and distal segments lighter in shade. Carapace brown with caput and chelicerae covered with a thick mat of short pale/cream coloured setae. Abdomen dark brown. Colouration in preservative is more faded and is in a shade of brown to reddish brown.

Carapace (Figs 3A, 4A): covered with short silvery grey hair, dense on caput and carapace edges. Fovea procured, slightly shorter than ocular width. Vestigial thick black bands radiating from the fovea running along the interstitial ridges. A few long bristles present on the ocular tubercle. A band of spinules present posterior to the fovea scattered in a fairly longitudinal manner.

Table 1. Distribution localities for Thrigmopoeinae.

Species	Locality	Coordinates	Elevation
***Cilantica agasthhyaensis* sp. nov.**	Ponmudi, Kerala	8.760796°, 77.118420°	860m
	Peppara WS, Kerala	8.672863°, 77.150788°	350m
***Cilantica kayi* comb. nov.**	Parambikulam Tiger Reserve, Kerala	10.400653°, 76.702295°	506m
	Nilambur	11.157000°, 76.372917°	108m
***Cilantica phsycadelicus* comb. nov.**	Ambanad Tea Estate, near Thenmala, Kerala	9.036470°, 77.100655°	552m
	Shendurney WS, Kerala	8.959858°, 77.092445°	315m
	Shabrimala, Periyar Tiger Reserve, Kerala	9.433912°, 77.079964°	460m
	Thenmala, Kerala	8.963158°, 77.064986°	200m
	Kulathupuzha, Kollam District, Kerala	8.908879°, 77.056018°	45m
***Haploclastus bratocolonus* sp. nov.**	Poochipara, Silent Valley NP, Kerala	11.112364°, 76.434254°	917m
Haploclastus cervinus	Kodaikanal in Palni hills, Tamil Nadu	10.245783°, 77.516650°	1723m
***Haploclastus montanus* sp. nov.**	Eravikulam National Park, Kerala	10.147262°, 77.038728°	2055m
	Waterfall estate, Vaplarai, Tamil Nadu	10.338100°, 77.023900°	1700m
	Munnar, Kerala	10.143495°, 77.048234°	1755m
Haploclastus nilgirinus	Oooty, Tamil Nadu	11.416562°, 76.694254°	2300m
	Kotagiri, Tamil Nadu	11.413296°, 76.864097°	1900m
	Connor, Tamil Nadu	11.357360°, 76.800258°	1840m
Haploclastus tenebrosus	High Wavy Mountains, Madurai district, Tamil Nadu	9.630997°, 77.394127°	1200m
***Haploclastus ajithii* sp. nov.**	Valparai, Tamil Nadu	10.359058°, 76.982951°	1134m
	outskirts of Akkamalai, Tamil Nadu	10.338167°, 77.023951°	1780m
Haploclastus validus	Aarey Milk Colony, Mumbai, Maharashtra	19.142988°, 72.880502°	84m
	Sanjay Gandhi NP, Mumbai, Maharashtra	19.208392°, 72.898796°	63m
	Matheran, Raighad district, Maharashtra	18.988886°, 73.268419°	800m
	Badlapur, Thane district, Maharashtra	19.153199°, 73.216693°	100m
	Kolad, Raighad district, Maharashtra	18.435859°, 73.237555°	43m
	Wai, Satara district, Maharashtra	17.943998°, 73.880630°	730m
	Mahabaleshwar, Satara district, Maharashtra	17.921639°, 73.655360°	1319m
	Waghzara, Kolhapur district, Maharashtra	16.933178°, 73.794663°	820m
Thrigmopoeus insignis	Kanara Ghats, Karnataka	14.775213°, 74.675022°	528m
	Castle Rock, Karnataka	15.397156°, 74.331300°	599m
	Dandeli-Anshi Tiger Reserve, Karnataka	14.997921°, 74.436426°	538m
	Mahadayi WS, Goa	15.641868°, 74.195589°	200m
Thrigmopoeus truculentus	Sirendri, Silent Valley NP, Kerala	11.092725°, 76.446181°	1023m
	Madikeri, Karnataka	12.412123°, 75.737441°	1100m
	Sharavati WS, Karnataka	14.132035°, 74.770669°	575m
	Bhadra WS, Karnataka	13.447100°, 75.549860°	1182m
	Agumbe, Karnataka	13.502938°, 75.087569°	682m
	Karwar, Karnataka	14.796866°, 74.135386°	109m
	Anshi NP, Karnataka	14.997921°, 74.436426°	538m
	Kudrimukh NP, Karnataka	13.224034°, 75.253721°	801m
	Mollen WS, Goa	15.299044°, 74.219528°	82m
	Madhei WS, Goa	15.641868°, 74.195589°	200m
	Amboli, Sawantwadi district, Maharashtra	15.961675°, 74.001194°	714m
	Radhanagri WS, Maharashtra	16.396221°, 73.944529°	670m
	Wayanad WS, Kerala	11.839531°, 76.050154°	785m

Figure 2. *Cilantica agasthyaensis* **sp. nov.** female in life.

Eyes (Fig. 4A): ratio of ocular quadrant width to length 2.2. AME largest, other eyes equal. Eye diameter: ALE, 0.6; AME, 0.4; PLE, 0.3; PME, 0.3. Distance between the eyes: AME-AME, 0.2; PME-PLE, 0.1; AME-ALE, 0.3; PME-PME, 1.1; ALE-PLE, 0.2. Ocular quadrate, 1.1 long, 2.4 wide. MOQ: length, 0.7; front width, 1.0; back width, 1.5.

Maxilla (Figs 4B, 5B): front length 4.0, back length 5.6 and 3.2 wide. Posterior ventral edge gently rounded and long; retrolateral face yellowish-red, smooth, glabrous. Cuspules: over 120 in anterior corner in roughly triangular region. Posterior edge almost straight, concave near heel. Thick spike setae in 2–3 rows present above the maxillary suture aligned along the suture; below the suture with thick long spike setae scattered in distal half of the prolateral face, not in a defined 'C' pattern.

Labium (Fig. 3B): 1.5 long, 2.0 wide with nearly 80 cuspules in band for one-fourths of anterior length; cuspules ca. similar in size to maxillary. Basal groove shallow, distinct with two distinct mounds.

Chelicera (Figs 4C, 4D, 5A): inter-cheliceral peg setae absent. Basal oral fringe of chelicerae lacking a cluster of thick long curved setae. Thick modified setae intermixed

with normal setae on basal half of oral fringe on retrolateral aspect. Promarginal teeth 11, 40 granules at basal cheliceral groove (Fig. 4C–D).

Sternum (Fig. 3B): longer than wide, high in centre, slopping gradually, covered with a mat of short brown and long, black setae. Posterior edge pointed but not separating coxae IV. Pedicel not clearly seen.

Sigilla: 3 pairs, posterior 1.4 diameter, ca. 1.4 lengths apart, ca.1.2 dist. from margin; middle 0.7 diameter, ca. 3.4 lengths apart, ca.0.5 dist. from the margin; anterior 0.3 diameter, ca. 3.9 apart, marginal.

Leg: formula 4123. Coxae- Prolateral face of coxa with thin, long horizontally aligned setae above the coxal suture, below suture with numerous short, thick spike setae scattered in the distal half of the coxa. Leg lengths (ta, mt, ti, pa, fe, total): leg I 4.1, 5.8, 7.4, 6.2, 10.7, 32.2; leg II 4.0, 4.6, 6.6, 5.1, 10.0, 30.3; leg III 2.9, 4.7, 4.0, 4.9, 7.9, 24.4; leg IV 3.2, 7.6, 7.3, 5.3, 10.7, 34.1; palp 4.6, -, 4.9, 4.4, 7.9, 21.8. Midwidths (fe, ti): leg I 2.4, 2.7; leg II 2.0, 2.2; leg III 2.7, 2.0; leg IV 2.6, 2.1; palp 2.1, 2.2. Retrolateral

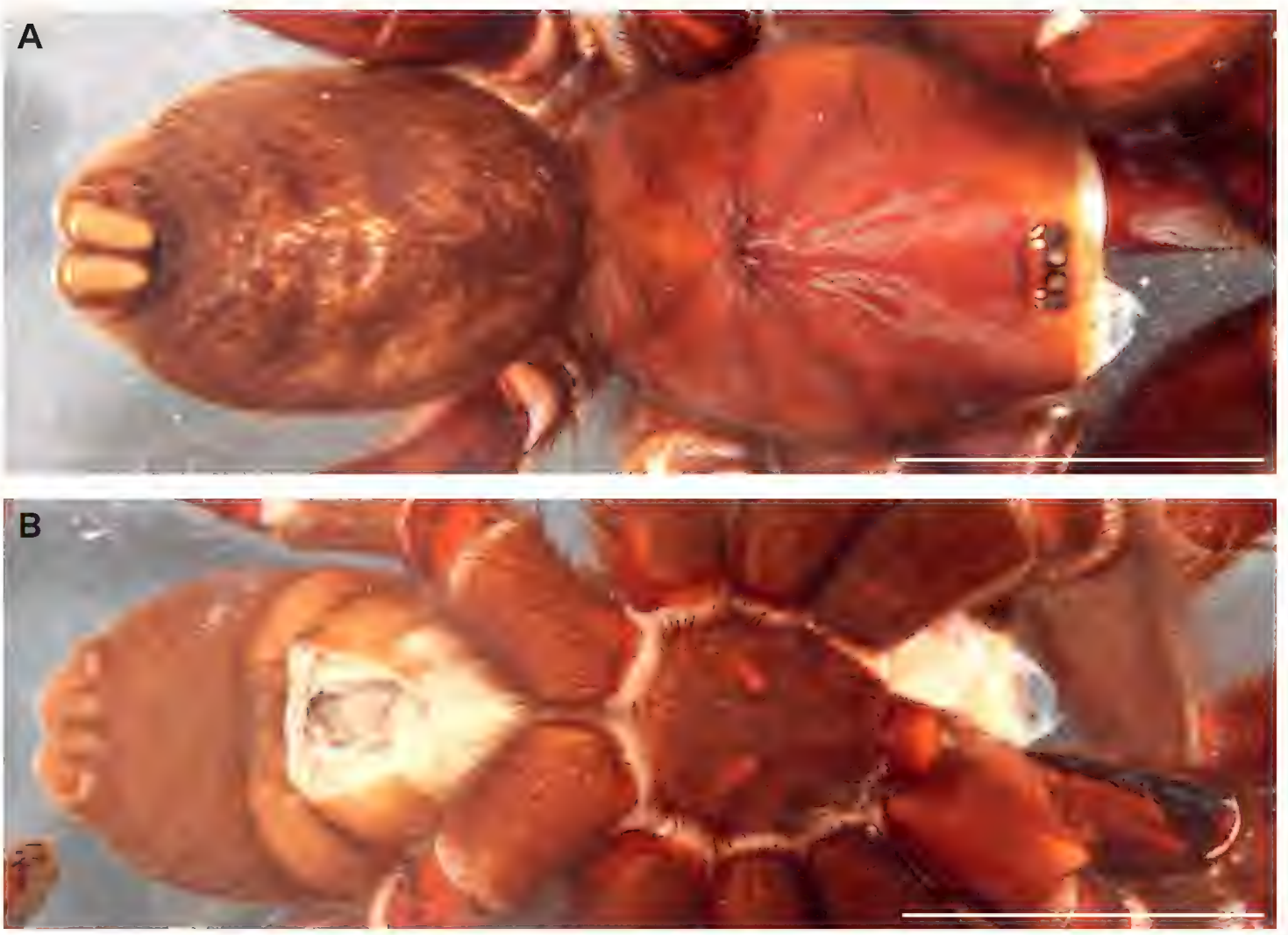

Figure 3. *Cilantica agasthyaensis* **sp. nov.** holotype female BNHS SP-125: **A** dorsal carapace and abdomen; **B** ventral view showing sternum and abdomen. Scale bar = 10mm.

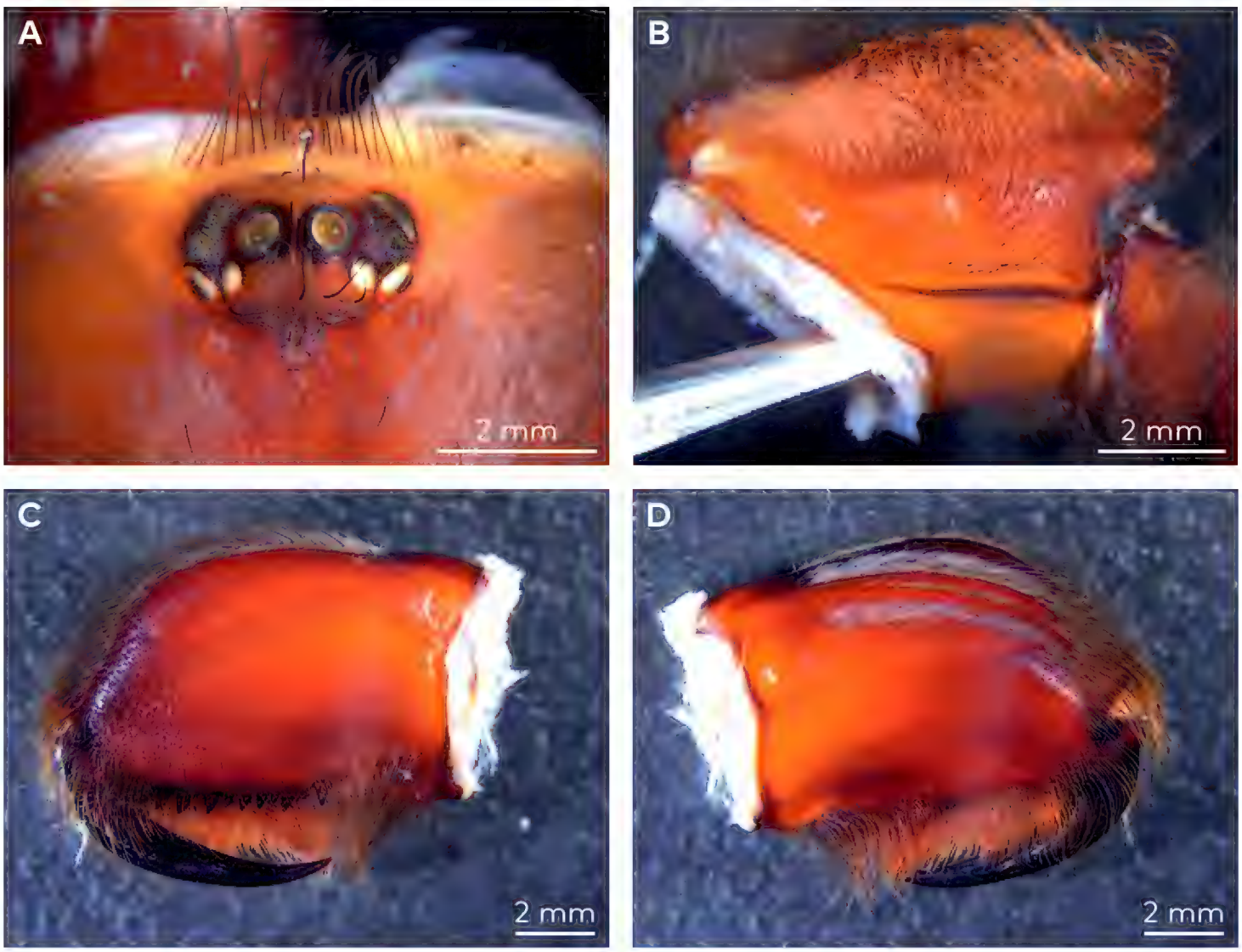

Figure 4. *Cilantica agasthyaensis* **sp. nov.** holotype female BNHS SP-125: **A** eyes; **B** prolateral view of maxilla; **C** chelicerae prolateral view; **D** chelicerae retorlateral view.

face with thick, long bristles in anterior distal region. Spines- leg II, ta, v 1, mt, v 1; leg III, ta, v 2, p 1, r 1; leg IV, ta, v 5, p 1, r 1.

Scopulae: thick, entire and undivided on tarsi I–III; tarsi IV with 2–3 rows of spike setae. Metatarsi I–II entire; metatarsi III for ⅔ length, not divided; on metatarsi IV for ¼ of length divided by 3–4 rows of spike setae. Scopula well developed.

Tricobothria: tarsi I, 29–30 clavate and 30–31 long and short filiform in distal half in two rows, tarsi II, 26–27 clavate and 23–24 long and short filiform in distal half in two rows; tarsi III, 30–31 clavate and 27–28 long and short filiform; tarsi IV, 24–25 clavate and 17–18 long and short filiform; Palp tarsi with 36–37 clavate and 16–17 long and short filiform.

Claws: inferior tarsal claw present only on tarsi III & IV. Superior tarsal claws on all legs without dentition; single bare claw on palp.

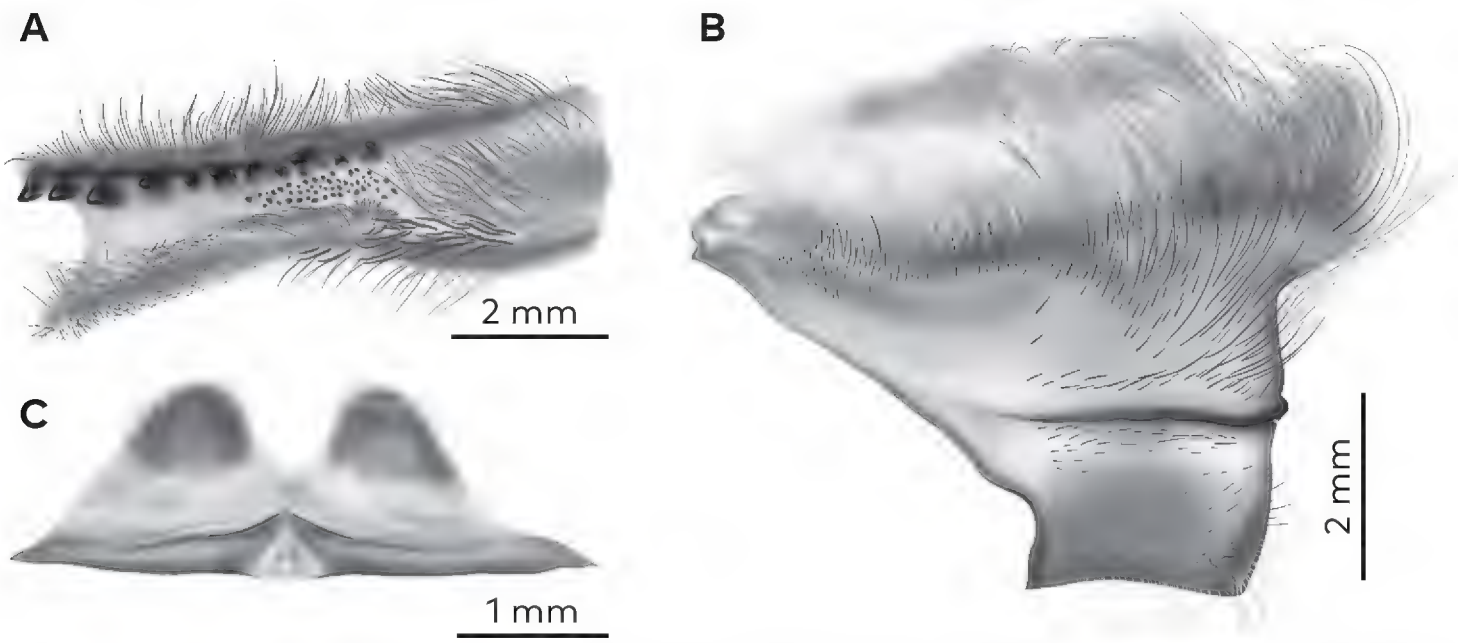

Figure 5. *Cilantica agasthyaensis* **sp. nov.** holotype female BNHS SP-125: **A** chelicerae ventral view; **B** prolateral view of maxilla; **C** spermathecae. Sketch by Hrishikesh Hardikar.

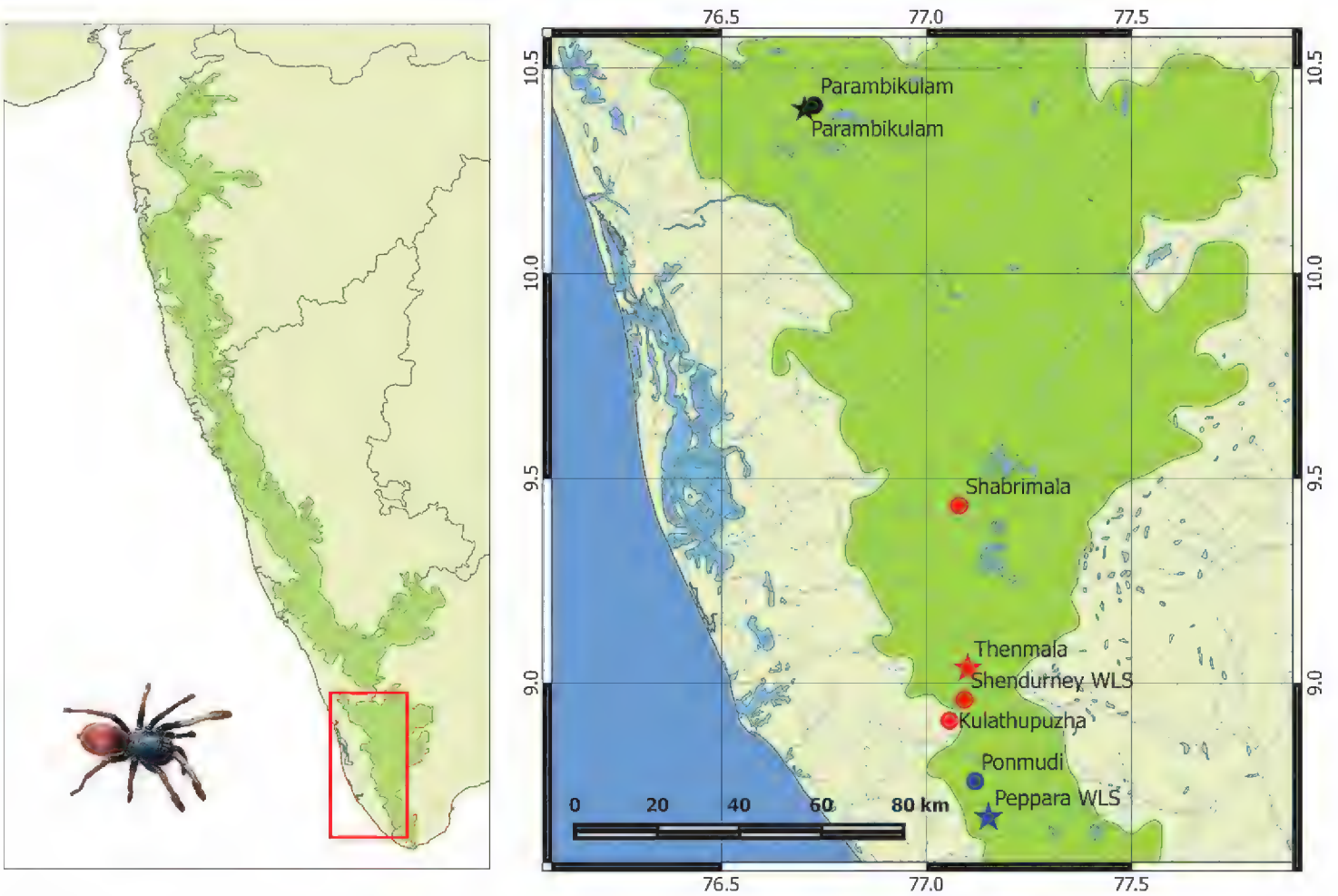

Figure 6. Distribution map for species of the genus *Cilantica* **gen. nov.** Star indicate type localities and circles indicate additional localities. Colour (**blue**) *Cilantica agasthyaensis* **sp. nov.**, (**red**) *Cilantica phsycadelicus* (**black**) *Cilantica kayi.*

Abdomen pilosity (Fig. 3A, B): cuticle not exposed dorsally and ventrally; dorsally covered with fine layer of brown long hair and bristles, many pallid; ventrally black with fine layer of many long black hair bristles.

Spinnerets: 2 pairs, blackish brown, covered with black hair.

Spermethecae (Fig. 5C): two seminal receptacles in shape of mounds separated by a median gap less than their widths.

Natural history and distribution: Burrows of the species were observed along roads and forest pathways on mud embankments/cliffs in Peppara Wildlife Sanctuary, Bonacaud and Ponmudi (Table 1, Fig. 6). Forest types of Peppara wildlife sanctuary are of southern hilltop tropical evergreen, west coast semi-evergreen and southern moist mixed deciduous forest. The burrow is about a foot deep with a tubular extension made up of soil and leaves as seen in members of the genus. Two females one each at Ponmudi and Peppara Wildlife Sanctuary were observed with egg sac which was held under the chelicerae.

***Cilantica kayi* (Gravely, 1915) comb. nov.**
Haploclastus kayi Gravely, 1915: 278
(Figs 7–10)

Holotype- immature female, ZSIK from Parambikulam, Cochin state. Examined.

Topotype female BNHS SP 124, along a road near Salim Ali Centre, Parambikulam Tiger Reserve, Kerala state, India (10.400653°, 76.702295° elevation 506m), collected by Rajesh Sanap and Zeeshan Mirza on 12th January 2014.

Diagnosis: A medium sized spider reaching a total length of 38mm. Overall in shade of grayish brown, legs being entirely gray. Chelicerae with 14 promarginal and nearly 40 small basal granules. Maxillary lobe moderately pronounced, gradually tapering and lacking a constriction at base. Anterior border of anterior eyes at the same plane/ level. Spines on leg I present. Spermathecae with two seminal receptacles in shape of mounds separated by a median gap less than their widths.

Comparison: *C. kayi* **comb. nov.** differs from *C. phsycadelicus* **comb. nov.** in being overall in a shade of grayish brown, legs being entirely gray lacking a blue luster (vs. shade of dark brown to black with blue luster on carapace and abdomen in *C. phsycadelicus* **comb. nov.**). Differs from *Cilantica agasthyaensis* **sp. nov.** in lacking a basal constriction at the base on anterior maxillary lobe (present in *Cilantica agasthyaensis* **sp. nov.**).

Description of topotype female BNHS SP124 (Fig. 8): carapace 20.2 long, 16.1 wide (L/W ration 1.3), chelicerae 10.8 long. Sternum 9.6 long, 8.0 wide (L/W 1.2). Abdomen 18.2 long, 12.3 wide (L/W 1.5). Spinnerets: PMS, 1.9 long, 1.2 wide, 0.7 apart; PLS, 3.6 basal, 1.4 middle, 2.7 distal; midwidths 1.7, 1.6, 1.3 respectively, apart 2.6.

Colouration (Figs 7, 8): overall in a shade of grayish brown, legs being entirely gray. Carapace brown with caput and chelicerae covered with a thick mat of short pale/cream coloured setae. Legs gray throughout with a clear pale band on tibia and patella. Abdomen dark brown. Colouration in preservative is more faded and is in a shade of brown to reddish brown.

Carapace (Fig. 8A): covered with short silvery grey hair, dense on caput and carapace edges. Fovea procured, slightly shorter than ocular width. Vestigial thick black bands radiating from the fovea running along the interstitial ridges. A few long bristles present on the ocular tubercle. A band of spinules present posterior to the fovea scattered in a fairly longitudinal manner.

Eyes (Fig. 8A): ratio of ocular quadrant width to length 1.9. AME largest, other eyes equal. Eye diameter: ALE, 0.7; AME, 0.6; PLE, 0.5; PME, 0.3. Distance between the eyes: AME-AME, 0.2; PME-PLE, 0.1; AME-ALE, 0.3; PME-PME, 1.5; ALE-PLE, 0.3. Ocular quadrate, 1.3 long, 3.1 wide. MOQ: length, 1.0; front width, 1.3; back width, 1.5.

Maxilla (Fig. 10B): front length 5.4, back length 8.1 and 3.4 wide. Posterior ventral edge gently rounded and long; retrolateral face yellowish-red, smooth, glabrous. Cuspules: over 125 in anterior corner in roughly triangular region. Posterior edge almost straight, concave near heel. Thick spike setae in 2–3 rows present above the maxillary suture aligned along the suture; below the suture with thick long spike setae scattered in distal half of the prolateral face, not in a defined 'C' pattern.

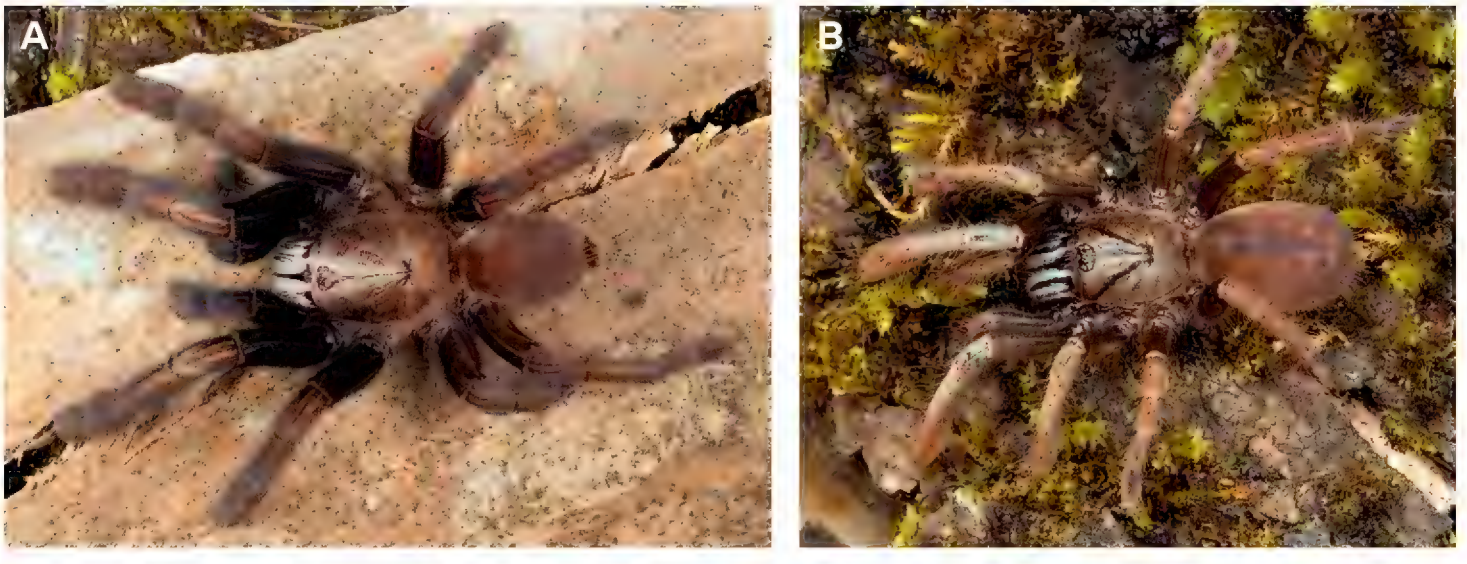

Figure 7. *Cilantica kayi* **comb. nov.** adult female in life: **A** adult female; **B** juvenile.

Figure 8. *Cilantica kayi* **comb. nov.** topotype female BNHS SP-124: **A** dorsal carapace and abdomen; **B** ventral view showing sternum and abdomen. Scale bar = 10mm.

Labium (Fig. 8B): 1.9 long, 2.5 wide with ~150 cuspules in band for one-fourths of anterior length; cuspules ca. similar in size to maxillary. Basal groove shallow, distinct with two distinct mounds.

Chelicera (Fig. 9A, 9B, 10A): inter-cheliceral peg setae absent. Basal oral fringe of chelicerae lacking a cluster of thick long curved setae. Thick modified setae intermixed with normal setae on basal half of oral fringe on retrolateral aspect. Promarginal teeth 14, ca. 40 granules at basal cheliceral groove.

Sternum (Fig. 8B): longer than wide, high in centre, slopping gradually, covered with a mat of short brown and long, black setae. Posterior edge pointed but not separating coxae IV. Pedicel not clearly seen.

Sigilla: 3 pairs, posterior 1.8 diameter, ca. 1.9 lengths apart; ca.1.4 dist. from margin; middle 0.8 diameter, ca. 4.2 lengths apart; ca.0.8 dist. from the margin; anterior 0.4 diameter, ca. 5.1 apart, marginal.

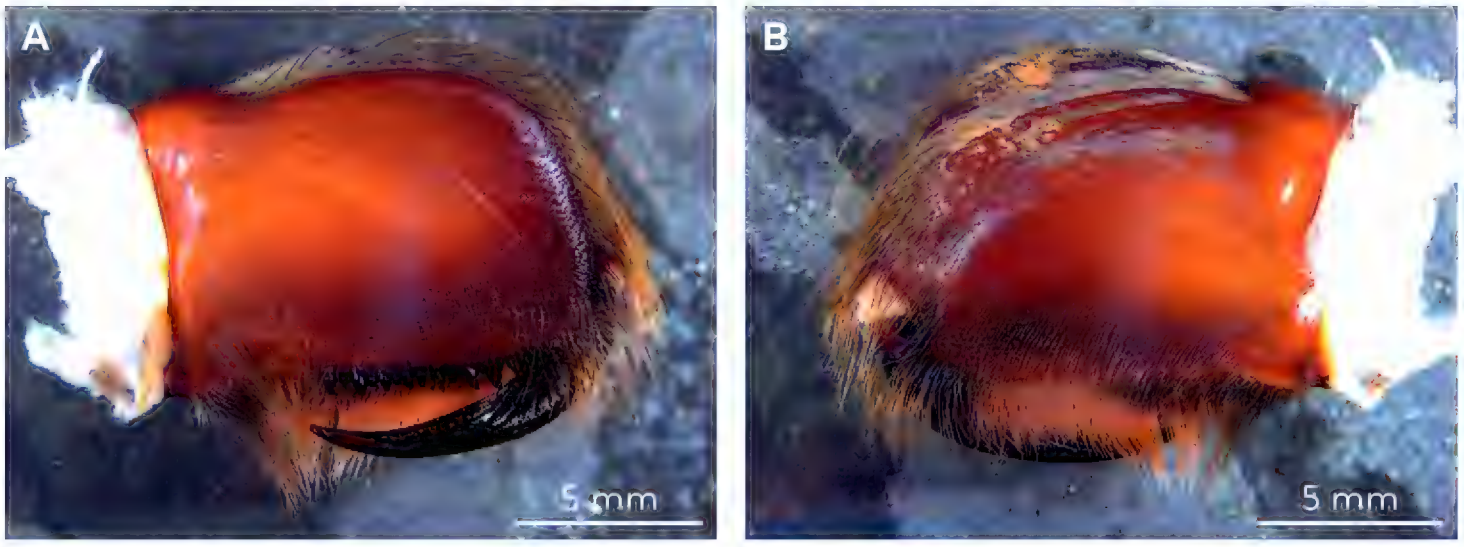

Figure 9. *Cilantica kayi* **comb. nov.** topotype female BNHS SP-124: **A** chelicerae prolateral view; **B** chelicerae retorlateral view.

Leg: formula 4123. Coxae- Prolateral face of coxa with thin, long horizontally aligned setae above the coxal suture, below suture with numerous short, thick spike setae scattered in the distal half of the coxa. Leg lengths (ta, mt, ti, pa, fe, total): leg I absent; leg II 4.9, 6.9, 9.3, 8.2, 13.7, 43; leg III 5.7, 5.8, 6.9, 5.3, 10.6, 34.3; leg IV 3.9, 9.7, 9.5, 6.4, 14.6, 44.1; palp 11.1, -, 6.8, 6.9, 5.8, 30.6. Midwidths (fe, ti): leg I absent; leg II 4.0, 3.4; leg III 4.4, 3.2; leg IV 3.5, 3.2; palp 2.7, 3.1. Retrolateral face with thick, long bristles in anterior distal region. Spines- leg II, ta, v 1; leg III, ta, v 2; leg IV, ta, v 13–14; palp ta, v 1, d 1.

Scopulae: thick, entire and undivided on tarsi I–III; tarsi IV with 3–4 rows of spike setae. Metatarsi I–II entire; metatarsi III for ⅔ length, not divided; on metatarsi IV for ¼ of length divided by 3–4 rows of spike setae. Scopula well developed.

Tricobothria: tarsi II, 28–29 clavate and 26–27 long and short filiform in distal half in two rows; tarsi III, 27–28 clavate and 25–27 long and short filiform; tarsi IV, 28–29 clavate and 25–26 long and short filiform; Palp tarsi with 28–29 clavate and 23–24 long and short filiform.

Claws: inferior tarsal claw present only on tarsi III & IV. Superior tarsal claws on all legs without dentition; single bare claw on palp.

Abdomen pilosity (Fig. 8A, 8B): cuticle not exposed dorsally and ventrally; dorsally covered with fine layer of brown long hair and bristles, many pallid; ventrally black with fine layer of many long black hair bristles.

Spinnerets: 2 pairs, blackish brown, covered with black hair.

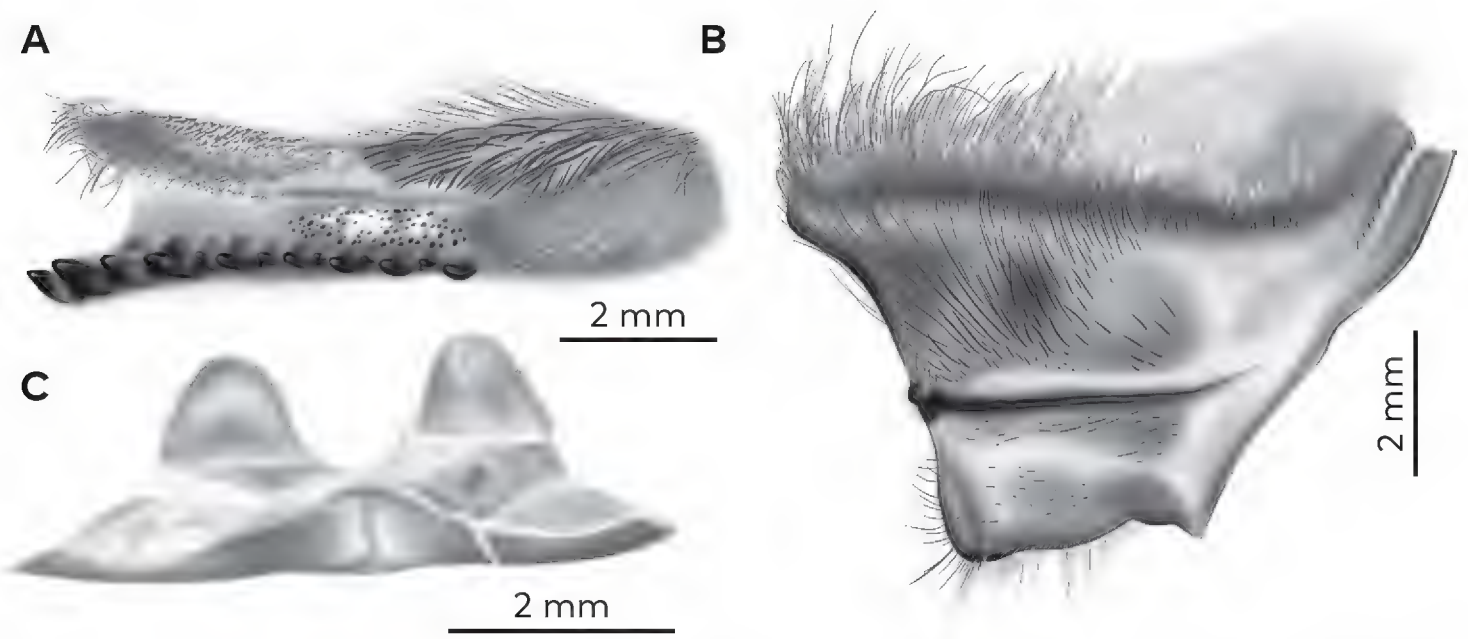

Figure 10. *Cilantica kayi* **comb. nov.** topotype female BNHS SP-124: **A** chelicerae ventral view; **B** prolateral view of maxilla; **C** spermathecae. Sketch by Hrishikesh Hardikar.

Spermethecae (Fig. 10C): two seminal receptacles in shape of mounds separated by a median gap less than their widths.

Natural history: The topotype female was dugout from a vertical burrow which was ca. two feet deep. The burrow shows a clear tubular extension above the ground made up of soil and leaves. The tubular burrow terminates into a bulbous chamber wider in diameter than the burrow diameter. The species is common at ~500m in the deciduous and semi-evergreen patches in Parambikulam Tiger Reserve (Table 1, Fig. 6). Several burrows of juvenile *C. kayi* were found to be occupied by buthid scorpion of the genus Isometrus, which likely feed on juvenile *C. kayi*.

***Cilantica phsycadelicus* (Sanap & Mirza 2014) comb. nov.**
Haploclastus devamatha Prasanth & Josae 2014: 495 *nomen nudum*
Thrigmopoeus phsycadelicus Sanap & Mirza 2014: 481
(Fig. 11, Table 1)

Material examined: holotype of *Thrigmopoeus phsycadelicus* female BNHS SP115 from Ambanad Tea Estate, near Thenmala, Kollam district, Kerala state, India (Sanap and Mirza 2014). For additional material examined see Sanap and Mirza (2014)

Comparison: *C. phsycadelicus* **comb. nov.** differs from *C. kayi* **comb. nov.** in being overall in shade of dark brown to black with blue luster on carapace and abdomen (vs. in a shade of grayish brown, legs being entirely gray lacking a blue luster in *C. kayi* **comb. nov.** and *Cilantica agasthyaensis* **sp. nov.**). Differs from *Cilantica agasthyaensis* **sp. nov.** in lacking a basal constriction at the base on anterior maxillary lobe (present in *Cilantica agasthyaensis* **sp. nov.**).

Figure 11. *Cilantica phsycadelicus* **comb. nov.** female in life.

Remarks: Prasanth and Sunil Jose (2014) described *Haploclastus devamatha* based on three specimens collected from Kulathupuzha, Kollam District, Kerala. In the description the authors designate a female as the holotype and two specimens of unknown sex as the paratypes without an intuitional registration number (see Article 73.1 ICZN) (ICZN, 1999). Furthermore, the original description lacks Zoobank registration. The holotype appears to be an immature specimen as the figure depicting the spermathecae is incorrect as it does not show the presence of spermathecae (Sanap and Mirza 2014). Sankaran & Sebastian (2018) synonymized *Thrigmopoeus phsycadelicus* Sanap & Mirza 2014 with *Haploclastus devamatha*. Given that the original description of the species appeared in an online-only journal and lacks a Zoobank registration, this work is not considered a valid publication as per 2012 amendments to the code (ICZN, 2012), and further, the unregistered type specimens, consequently the nomen is here proposed to be treated as *nomen nudum* and is not available in which case, the nomen *Cilantica phsycadelicus* Sanap & Mirza 2014 comb. nov. be used for this taxon.

Haploclastus Simon, 1892

Type species: *H. cervinus* Simon, 1892

Species included: *Haploclastus ajithii* **sp. nov.**, *Haploclastus bratocolonus* **sp. nov.,** *Haploclastus cervinus, Haploclastus montanus* **sp. nov.,** *Haploclastus nilgirinus, Haploclastus tenebrosus, Haploclastus validus.*

Diagnosis: Fovea shallow, slightly procurved to straight. Posterior sternal sigilla not very deep and proximal to sternal margin. Retrolaeral face of chelicerae with parallel rows of thick lanceolate setae. Prolateral face of maxilla with stout thorns or long black bristles arranged below and above maxillary suture. Spermathecae in shape of fused or indipendent mounds. Embolus of palp bulb stout ends in a scoop.

Description – Medium sized spiders 16–31. Carapace ovate, hirsute, with two clear (setae-less) bands on both sides of the caput. Caput high in females. Fovea procurved, not straight. Eye group sub-quadrate to wider than long, ocular tubercle well defined. Clypeus narrow. Chelicerae normal, with 16–25 teeth on promargin of furrow, basomesally 49–50 small teeth. Labium wider than long. Labiosternal grove with two distinct mounds. Cuspules 220–265 in the sub-apical region of the labium. Maxillae longer than wide, overall setose, prolateral anterior angle distinctly produced, >100 cuspules distributed along proximal prolateral angle. Serrula absent. Sternum as long as wide, sigilla small oval, submarginal, posterior sigilla centrally placed, deep. Prolateral face of maxilla in females with 2–3 rows of stout thorns arranged along the maxillary suture line below and above it, below this row, long black thick setae scattered over the surface below the maxillary suture. Maxillary stridulatory setae not evident in males. Retrolateral face of maxilla and coxa of legs with thick spike setae on their dorsal edge. Legs moderately stout, hirsute, spines present except on femora & coxa. Abdomen hirsute, without pattern. PMS well-developed; PLS, apical segment digitiform. Males lack tibial apophysis. Embolus of palp bulb stout ends in a blunt tip resembling a duck's bill with several keels. Spermathecae fused, in the form of a brick with slight raised edges resembling mounds.

Comments: The species *Haploclastus satyanus* (Barman, 1978) was described from Shillong, Meghalaya state. Extensive surveys conducted across has only yeilded members of the subfamily Eumenophorinae and Selenocosmiinae (personal obseration). Thereby I propose that the species *Haploclastus satyanus* be treated as a member of the subfamily Selenocosmiinae, mostly *Chilobrachys*, which is quite common in and around Shillong.

Key to the genus *Haploclastus*

1 – Females 2
– Males 7

2 – Scopulae on tarsi undivided 3
– Scopulae on tarsi divided 6

3 – First leg slightly longer than leg IV ..... *H. cervinus*
– First leg shorter than leg IV 4

4 – Inferior tarsal claw present only on tarsi III ..... *H. bratocolonus* **sp. nov.**
– Inferior tarsal claw present on tarsi III and/or IV 5

5 – Inferior tarsal claw present only on tarsi IV ..... *H. nilgirinus*
– Inferior tarsal claw present on tarsi III and IV ..... *H. montanus* **sp. nov.**

6 – Chelicerae with two rows of teeth, spermathecae fused in shape of a brick, over 200 cuspules on labium on 1/3 of labium ..... *H. validus*
– Chelicerae with one row of teeth, less than 60 cuspules on labium present only on the anterior labial border, spermathecae with two independent receptacles ..... *H. ajithii* **sp. nov.**

7 – Embolus tip directed downwards ..... *H. tenebrosus*
– Embolus tip directed forward ..... *H. montanus* **sp. nov.**

***Haploclastus bratocolonus* sp. nov.**
LSID: urn:lsid:zoobank.org:act:75D1D9DC-4D93-4200-A91C-F4871539AF38
(Figs 12–15)

Holotype- female BNHS SP 128, near a stream Poochipara, Silent Valley National Park, Kerala state, India (11.112364°, 76.434254°, elevation 917m), collected by Rajesh Sanap & Zeeshan Mirza on 18th January 2014. paratype female from the same locality BNHS SP 129.

Diagnosis: Adults in a shade of black to dark brown. Inferior tarsal claw present only on tarsi III. Spermathecae with two high mounds fused at base.

Comparison: *Haploclastus bratocolonus* **sp. nov.** differs from known species of the genus in bearing inferior tarsal claw only on tarsi of leg III.

Etymology: The specific epithet is a compound word formed by fusion of two Latin words "brato" which means tree and "colonus" which means dweller implying a tree dwelling species.

Description of holotype female BNHS SP 128 (Fig. 12): carapace 15.2 long, 12.6 wide (L/W ration 1.2), chelicerae 10.8 long. Sternum 7.5 long, 5.4 wide (L/W 1.2). Abdomen 15.7 long, 9.9 wide (L/W 1.4). Spinnerets: PMS, 1.6 long, 0.6 wide, 0.2 apart; PLS, 2.4 basal, 1.4 middle, 1.7 distal; midwidths 1.2, 1.2, 1.0 respectively, apart 1.1.

Colouration (Fig. 12, 13): overall in a shade of black to dark brown. Carapace black with thin mat of pale setae, abdomen dark brownish to black. Colouration in preservative is more faded and is in a shade of brown to reddish brown.

Carapace (Fig. 13A): covered with short silvery grey hair, dense on caput and carapace edges. Fovea procured, slightly shorter than ocular width. Vestigial thick black bands radiating from the fovea running along the interstitial ridges. A few long bristles present on the ocular tubercle. A band of spinules present posterior to the fovea scattered in a fairly longitudinal manner.

Figure 12. *Haploclastus bratocolonus* **sp. nov.** holotype female in life.

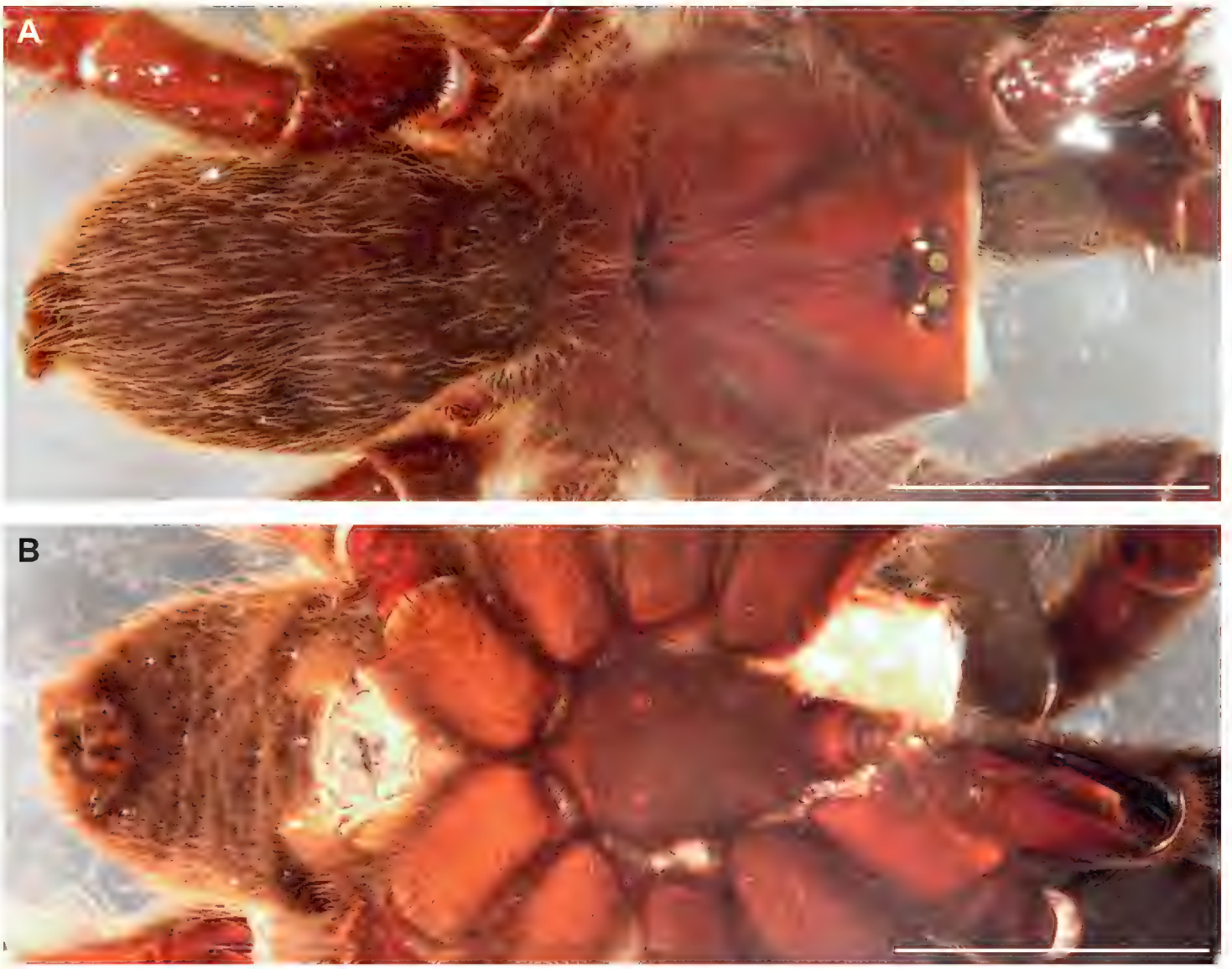

Figure 13. *Haploclastus bratocolonus* **sp. nov.** holotype female BNHS SP-128: **A** dorsal carapace and abdomen; **B** ventral view showing sternum and abdomen. Scale bar = 10mm.

Eyes (Fig. 14A): ratio of ocular quadrant width to length 2.2. AME largest, other eyes equal. Eye diameter: ALE, 0.5; AME, 0.5; PLE, 0.4; PME, 0.4. Distance between the eyes: AME-AME, 0.4; PME-PLE, 0.1; AME-ALE, 0.3; PME-PME, 1.4; ALE-PLE, 0.3. Ocular quadrate, 1.8 long, 3.3 wide. MOQ: length, 1.0; front width, 0.7; back width, 2.1.

Maxilla (15B): front length 4.4, back length 5.3 and 3.0 wide. Posterior ventral edge gently rounded and long; retrolateral face yellowish-red, smooth, glabrous. Cuspules: over 130 in anterior corner in roughly triangular region. Posterior edge almost straight, concave near heel. Thick spike setae in 2–3 rows present above the maxillary suture aligned along the suture; below the suture with thick long spike setae scattered in distal half of the prolateral face, not in a defined 'C' pattern.

Labium: 2.1 long, 2.2 wide with nearly 120 cuspules in band for one-fourths of anterior length; cuspules ca. similar in size to maxillary. Basal groove shallow, distinct with two distinct mounds.

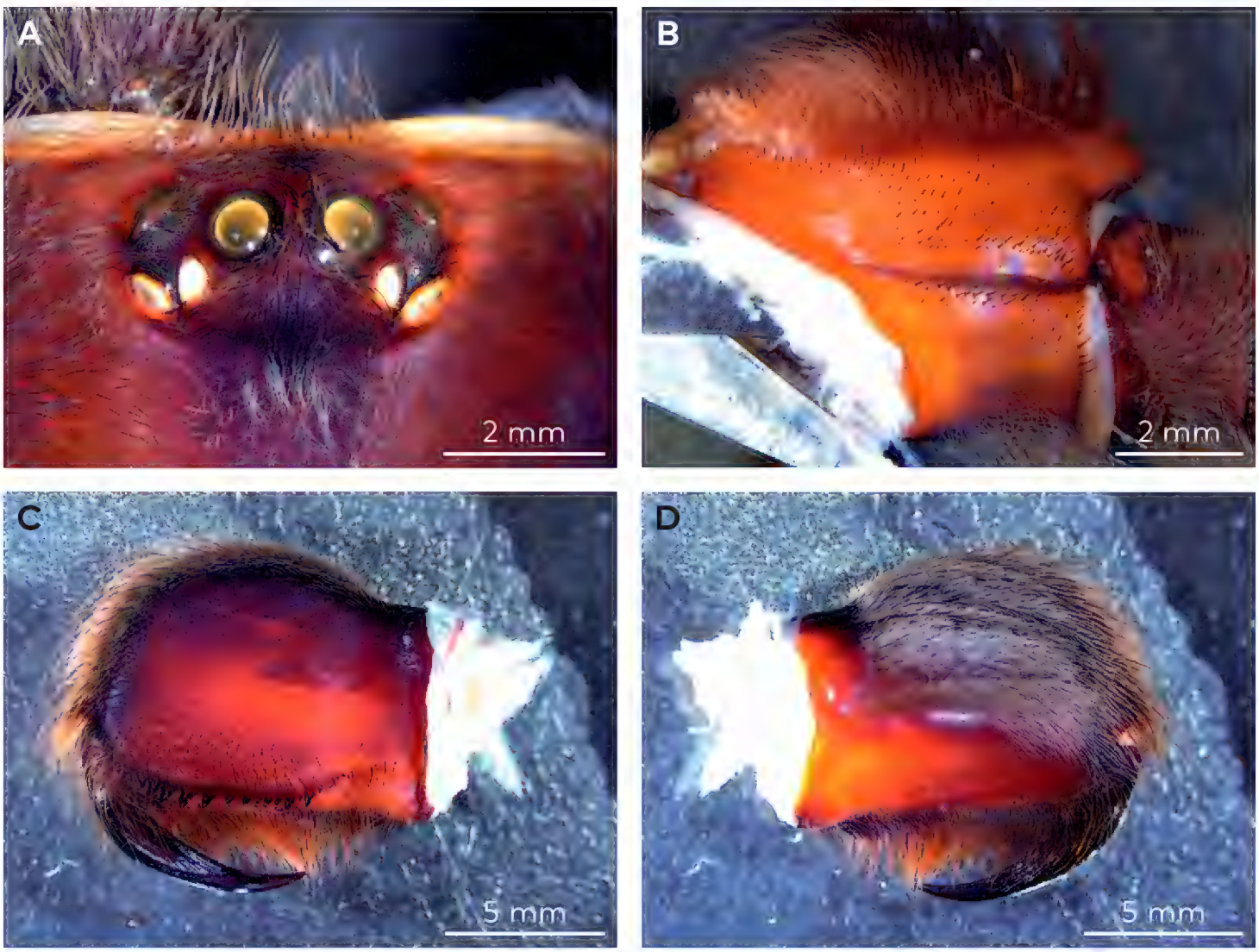

Figure 14. *Haploclastus bratocolonus* **sp. nov.** holotype female BNHS SP-128: **A** eyes; **B** prolateral view of maxilla; **C** chelicerae prolateral view; **D** chelicerae retorlateral view.

Chelicera: inter-cheliceral peg setae absent. Basal oral fringe of chelicerae lacking a cluster of thick long curved setae. Thick modified setae intermixed with normal setae on basal half of oral fringe on retrolateral aspect. Promarginal teeth 15, many small granules at basal cheliceral groove (Fig. 14C–D).

Sternum (Fig. 13B): longer than wide, high in centre, slopping gradually, covered with a mat of short brown and long, black setae. Posterior edge pointed but not separating coxae IV. Pedicel not clearly seen.

Sigilla: 3 pairs, posterior 0.9 diameter, ca. 2.2 lengths apart, ca.0.8 dist. from margin; middle 0.4 diameter, ca. 5.3 lengths apart, marginal; anterior extremely small, marginal.

Leg: formula 4123. Coxae- Prolateral face of coxa with thin, long horizontally aligned setae above the coxal suture, below suture with numerous short, thick spike setae scattered in the distal half of the coxa. Leg lengths (ta, mt, ti, pa, fe, total): leg I 5.6, 8.3, 10.9, 5.1, 13.3, 43.2; leg II 5.6, 7.8, 10.6, 5.5, 11.8, 41.3; leg III 5.4, 6.6, 8.0, 4.4, 9.5, 33.9; leg IV 4.9, 10.2, 10.0, 6.4, 11.1, 42.6; palp 6.9, -, 5.6, 3.3, 9.0, 24.8. Midwidths (fe,

ti): leg I 2.9, 2.7; leg II 2.6, 2.3; leg III 2.7, 2.3; leg IV 2.3, 2.3; palp 2.6, 2.4. Retrolateral face with thick, long bristles in anterior distal region. Spines- lig I, mt, v 1; leg II, mt, v 3; leg III, mt, v 2, p 2, r 1, d 5, ti, v 1; leg IV, mt, v 6, p 1, r 2.

Scopulae: thick, entire and undivided on tarsi I–III; tarsi IV with 3–4 rows of spike setae in its basal half not dividing the scapulae. Metatarsi I–II entire; metatarsi III for ⅔ length, not divided; on metatarsi IV for ¼ of length divided by 2–3 rows of spike setae. Scopula well developed.

Tricobothria: tarsi I, 23–24 clavate and 35–36 long and short filiform in distal half in two rows, tarsi II, 33–34 clavate and 30–31 long and short filiform in distal half in two rows; tarsi III, 30–31 clavate and 29–30 long and short filiform; tarsi IV, 30–31 clavate and 32–33 long and short filiform; Palp tarsi with 20–21 clavate and 8–9 long and short filiform.

Claws: inferior tarsal claw present only on tarsi III. Superior tarsal claws on all legs without dentition; single bare claw on palp.

Abdomen pilosity (Fig. 13A, B): cuticle not exposed dorsally and ventrally; dorsally covered with fine layer of brown long hair and bristles, many pallid; ventrally black with fine layer of many long black hair bristles.

Spinnerets: 2 pairs, blackish brown, covered with black hair.

Spermethecae (Fig. 15C): two high mounds fused at base.

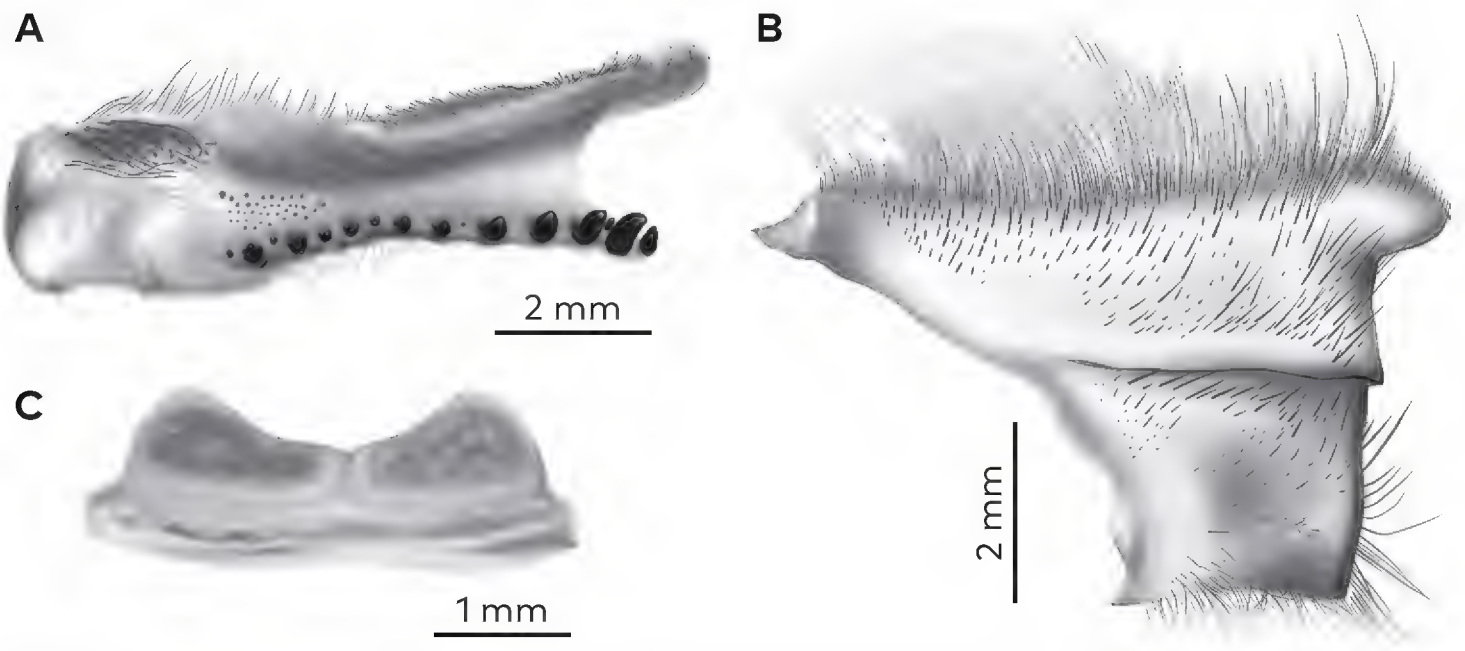

Figure 15. *Haploclastus bratocolonus* **sp. nov.** holotype female BNHS SP-128: **A** chelicerae ventral view; **B** prolateral view of maxilla; **C** spermathecae. Sketch by Hrishikesh Hardikar.

Natural history: All *Haploclastus bratocolonus* **sp. nov.**, specimens were collected from tree hollows along a river in Silent Valley National Park, in Kerala state (Fig. 16, Table 1). The type locality is characterized by West coast tropical evergreen forest. All burrows were found ca. 1.5m above the ground to about 4m above the ground. All burrows of the spiders were found along a river. Search made in the adjoining forest at two different localities in the park did not yield any specimen suggesting that the tarantulas prefer hard wood ravine dwelling tree species with hollow trunks. One of the paratype female was found with an egg sac.

***Haploclastus montanus* sp. nov.**
LSID: urn:lsid:zoobank.org:act:2E6CEE7C-F866-4F7A-A1A2-8CB53F57528C
(Figs 16–23, Table 1)

Holotype: male BNHS SP 130, shoal patches near Rajamallai, Eravikulam National Park, Kerala state, India (10.10.147262°, 77.038728°, elevation 2055m), collected by Rajesh Sanap and Zeeshan Mirza on 4th January 2014. Paratype: 1 female BNHS SP 131, same data as holotype.

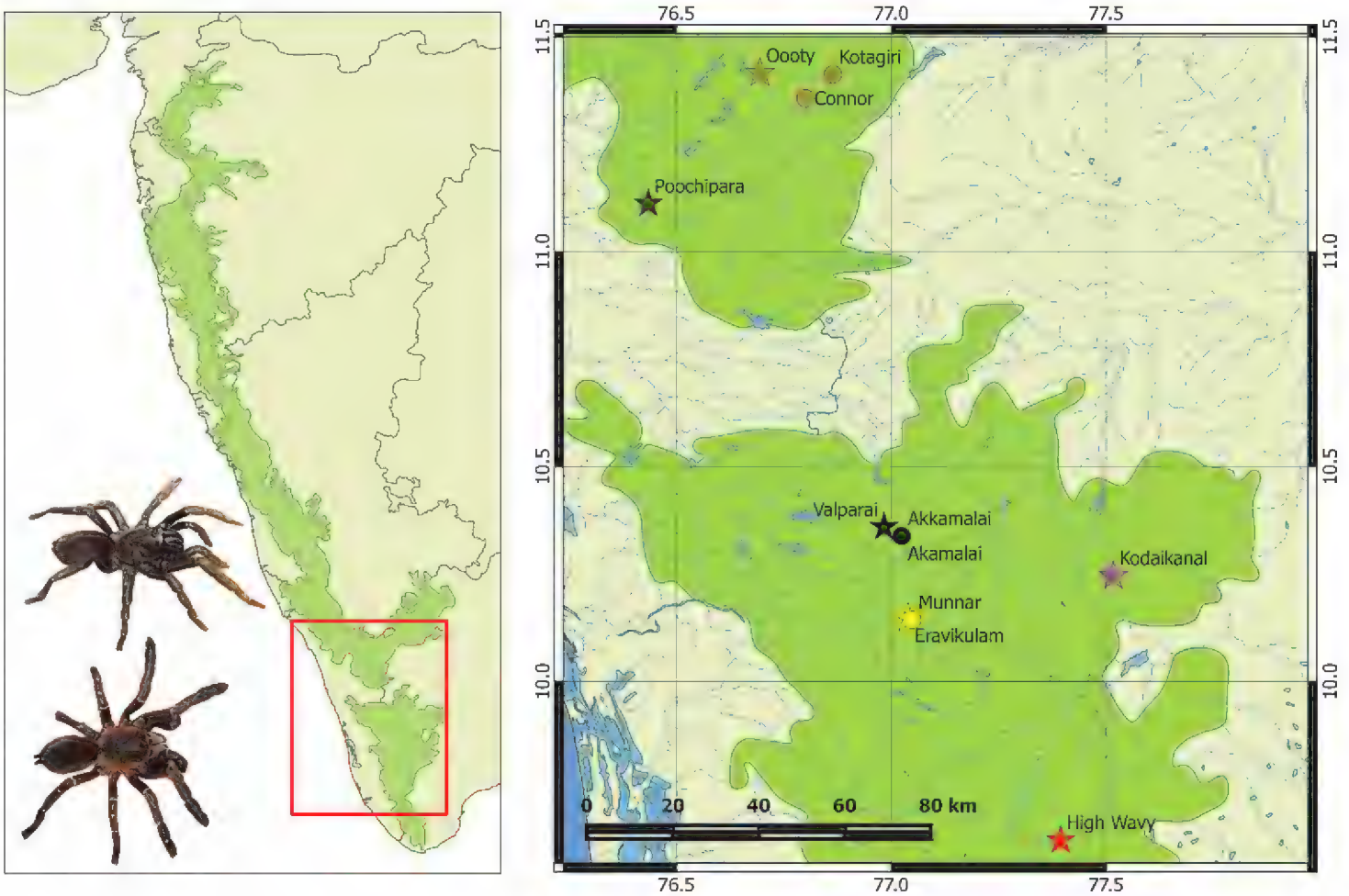

Figure 16. Distribution map for species of the genus *Haploclastus*. Star indicate type localities and circles indicate additional localities. Colour (light brown) *Haploclastus nilgirinus*, (**bark brown**) *Haploclastus bratocolonus* **sp. nov.**, (**black**) *Haploclastus ajithii* **sp. nov.**, (**yellow**) *Haploclastus montanus* **sp. nov.**, (**purple**) *Haploclastus cervinus*, (**red**) *Haploclastus tenebrosus*.

Etymology: The specific epithet refers to 'mountain dwelling' as the new species if found at high elevation shoal forests.

Diagnosis: Adult overall in a shade of black to dark brown. Maxillary prolateral face with long bristles scattered in a diffused manner. Inferior tarsal claw present on tarsi III & IV. Spermathecae in shape of two low fused mounds. Male palp embolus gradually narrowing into a scoop, ventral aspect of embolus tip with numerous keels.

Description of holotype male BNHS SP 130 (Fig. 17A): carapace 10.7 long, 10.2 wide (L/W ration 1.0), chelicerae 6.35 long. Sternum 5.2 long, 4.7 wide (L/W 1.1). Abdomen 14.0 long, 7.9 wide (L/W 1.8). Spinnerets: PMS, 1.2 long, 0.5 wide, 0.5 apart; PLS, 2.0 basal, 1.4 middle, 1.9 distal; midwidths 1.2, 1.0, 0.7 respectively, apart 1.3.

Colouration (Fig. 17A, 18): overall in a shade of black to dark brown. Colouration in preservative is more faded and is in a shade of brown to reddish brown lacking the dark black colouration as seen in life.

Carapace (Fig. 18A): covered with dense mat of short golden brown setae throughout. Fovea procured, slightly shorter than ocular width. Long bristles in a line between the eye tubercle and fovea.

Eyes (Fig. 19A): ratio of ocular quadrant width to length 2.0. ALE largest, other eyes equal. Eye diameter: ALE, 0.5; AME, 0.3; PLE, 0.3; PME, 0.3. Distance between the eyes: AME-AME, 0.3; PME-PLE, 0.07; AME-ALE, 0.2; PME-PME, 1.4; ALE-PLE, 0.2. Ocular quadrate, 1.3 long, 2.6 wide. MOQ: length, 0.4; front width, 1.2; back width, 1.6.

Figure 17. *Haploclastus montanus* **sp. nov.** in life: **A** holotype male BNHS SP-130; **B** paratype female BNHS SP-131.

Maxilla (Fig. 19B): front length 3.0, back length 3.6 and 2.4 wide. Posterior ventral edge gently rounded and long; retrolateral face yellowish-red, smooth, glabrous. Cuspules: over 90 in anterior corner in roughly triangular region. Posterior edge almost straight, concave near heel. Thick spike setae in 2–3 rows present above the maxillary suture aligned along the suture; below the suture with thick long spike setae scattered in distal half of the prolateral face, not in a defined 'C' pattern.

Labium (Fig. 18B): 1.5 long, 1.5 wide with nearly 155 cuspules in band for one-fourths of anterior length; cuspules ca. similar in size to maxillary. Basal groove shallow, distinct with two distinct mounds.

Chelicera (Figs 19C, 19D): inter-cheliceral peg setae absent. Basal oral fringe of chelicerae lacking a cluster of thick long curved setae. Thick modified setae intermixed with normal setae on basal half of oral fringe on retrolateral aspect. Promarginal teeth 12, 23 small basosomal teeth (Figs 19C–D).

Sternum (Fig. 18B): longer than wide, high in centre, slopping gradually, covered with a mat of short brown and long, black setae. Posterior edge pointed but not separating coxae IV. Pedicel not clearly seen.

Figure 18. *Haploclastus montanus* **sp. nov.** holotype male BNHS SP-130: **A** dorsal carapace and abdomen; **B** ventral view showing sternum and abdomen. Scale bar = 10mm.

Sigilla: 3 pairs, posterior 0.5 diameter, ca. 2.1 lengths apart, ca.0.4 dist. from margin; middle 0.3 diameter, ca. 3.5 lengths apart, marginal; anterior very small, marginal.

Leg: formula 4123. Coxae- Prolateral face of coxa with thin, long horizontally aligned setae above the coxal suture, below suture with numerous short, thick spike setae scattered in the distal half of the coxa. Leg lengths (ta, mt, ti, pa, fe, total): leg I 5.2, 8.1, 8.4, 5.2, 10.3, 37.2; leg II 4.0, 8.3, 8.4, 4.9, 10.8, 36.4; leg III 3.2, 8.9, 6.1, 3.5, 8.4, 30.1; leg IV 3.6, 7.3, 7.4, 4.1, 8.2, 30.6; palp 1.8, -, 5.0, 3.6, 6.9, 17.3. Midwidths (fe, ti): leg I 1.8, 2.0; leg II 1.8, 1.6; leg III 1.9, 1.5; leg IV 1.8, 1.7; palp 1.5, 1.8. Retrolateral face with thick, long bristles in anterior distal region. Spines- two spines each present on ventral tarsi of leg III & IV.

Scopulae: thick mat, entire and undivided on tarsi I–IIV; tarsi IV with 2–3 rows of spike setae in its basal half not parting scapulae. Metatarsi I–II entire; metatarsi III for ⅔ length, not divided; on metatarsi IV for ¼ of length not divided. Scopula well developed.

Figure 19. *Haploclastus montanus* **sp. nov.** holotype male BNHS SP-130: **A** eyes; **B** prolateral view of maxilla; **C** chelicerae prolateral view; **D** chelicerae retorlateral view.

Tricobothria: tarsi I, 25–26 clavate and 35–36 long and short filiform in basal half in two rows; tarsi II, 19–20 clavate and 30–31 long and short filiform in distal half in two rows; tarsi III, 39–40 clavate and 35–36 long and short filiform; tarsi IV, 30–31 clavate and 35–36 long and short filiform; Palp tarsi with 20–21 clavate and 10–11 long and short filiform.

Claws: inferior tarsal claw present only on tarsi III & IV. Superior tarsal claws on all legs without dentition; single bare claw on palp.

Abdomen pilosity (Fig. 18A, 18B): cuticle not exposed dorsally and ventrally; dorsally covered with fine layer of black intermixed with long many pallid; ventrally black with fine layer of many long black hair bristles.

Spinnerets: 2 pairs, blackish brown, covered with black hair.

Palp bulb (Figs 20A, 20B, 20C): embolus gradually narrowing into a scoop. Ventral aspect of embolus tip with numerous keels.

Description of paratype female BNHS SP 131 (Fig. 17B): carapace 11.8 long, 9.5 wide (L/W ration 1.3), chelicerae 7.18 long (Fig. 21A). Sternum 5.8 long, 4.1 wide (L/W 1.4). Abdomen 15.3 long, 10.2 wide (L/W 1.5). Spinnerets: PMS, 1.1 long, 0.8 wide, 0.5 apart; PLS, 2.0 basal, 1.0 middle, 1.9 distal; midwidths 1.4, 1.2, 1.0 respectively, apart 1.6.

Colouration (Fig. 17B, 22A, 22B): overall in a shade of brown as opposed to black male. Carapace and abdomen dark brownlish. Colouration in preservative is more faded and is in a shade of brown to reddish brown.

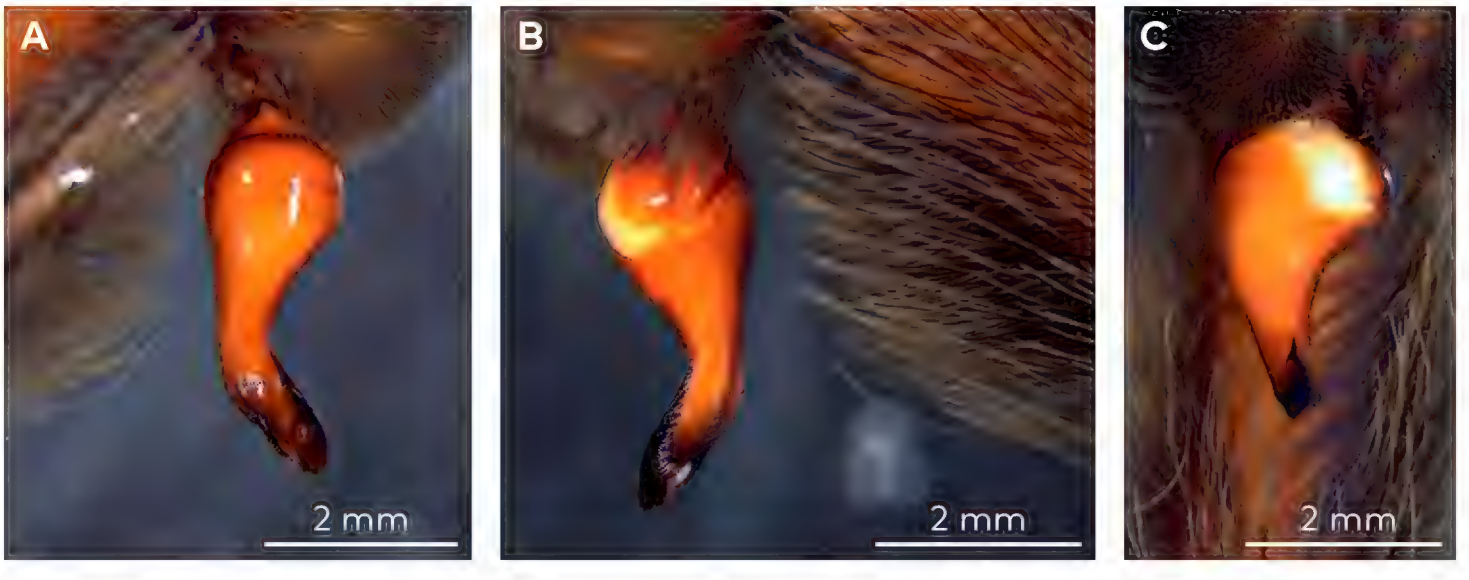

Figure 20. *Haploclastus montanus* **sp. nov.** holotype male BNHS SP-130 left palp bulb: **A** prolateral; **B** retrolateral; **C** dorsal.

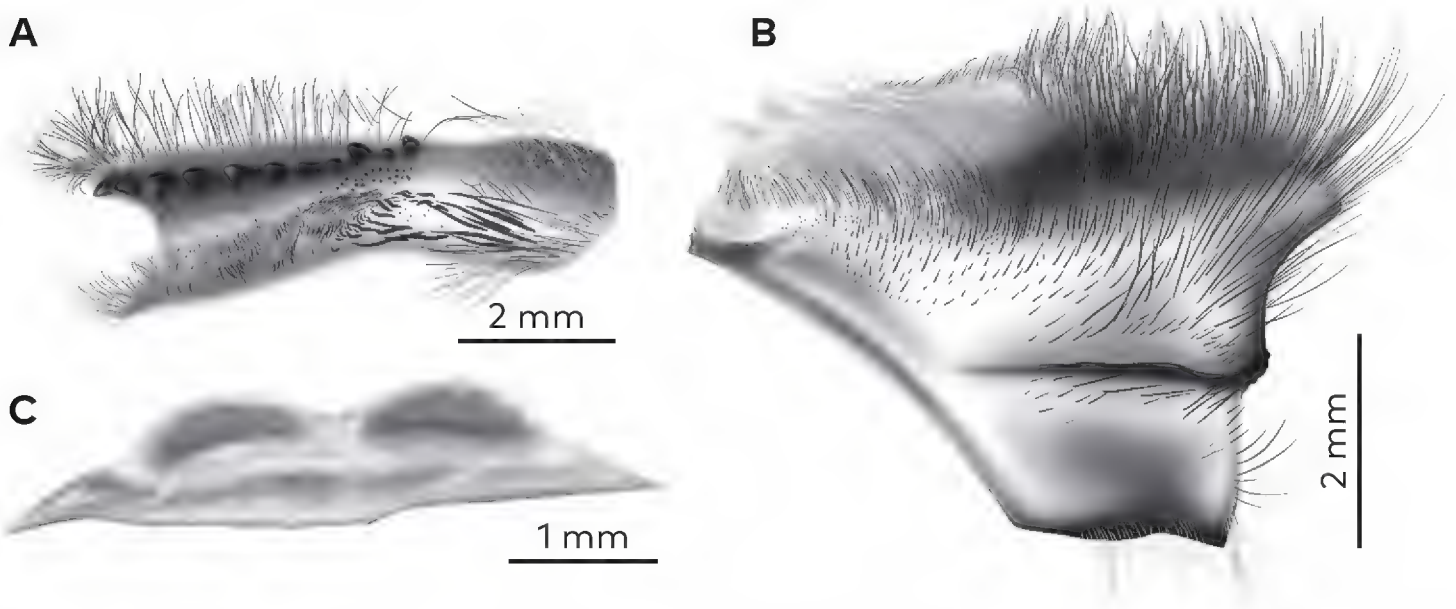

Figure 21. *Haploclastus montanus* **sp. nov.** paratype female BNHS SP-131: **A** chelicerae ventral view; **B** prolateral view of maxilla; **C** spermathecae. Sketch by Hrishikesh Hardikar.

Carapace (Fig. 22A): covered with short brown setae, mat not dense as seen in males of the species. Fovea slightly procured, equal to ocular width. A few long bristles present on the ocular tubercle. A band of spinules present posterior to the fovea scattered in a fairly longitudinal manner.

Eyes (Fig. 23A): ratio of ocular quadrant width to length 1.9. AME largest, other eyes equal. Eye diameter: ALE, 0.4; AME, 0.6; PLE, 0.4; PME, 0.4. Distance between the eyes: AME-AME, 0.3; PME-PLE, 0.8; AME-ALE, 0.3; PME-PME, 1.3; ALE-PLE, 0.2. Ocular quadrate, 1.4 long, 2.6 wide. MOQ: length, 0.7; front width, 1.1; back width, 1.8.

Maxilla (Fig. 23B): front length 3.0, back length 4.0 and 2.5 wide. Posterior ventral edge gently rounded and long; retrolateral face yellowish-red, smooth, glabrous. Cuspules: over 120 in anterior corner in roughly triangular region. Posterior edge almost straight, concave near heel. Thick spike setae in 2–3 rows present above the maxillary suture aligned along the suture; below the suture with thick long spike setae scattered in distal half of the prolateral face, not in a defined 'C' pattern.

Labium: 1.7 long, 2.0 wide with nearly 115 cuspules in band for one-fourths of anterior length; cuspules ca. similar in size to maxillary. Basal groove shallow, distinct with two distinct mounds.

Chelicera (Figs 23C, 23D): inter-cheliceral peg setae absent. Basal oral fringe of chelicerae lacking a cluster of thick long curved setae. Thick modified setae intermixed with normal setae on basal half of oral fringe on retrolateral aspect. Promarginal teeth 10, 18–20 small granules at basal cheliceral groove (Fig. 3A).

Sternum (Fig. 22B): longer than wide, high in centre, slopping gradually, covered with a mat of short brown and long, black setae. Posterior edge pointed but not separating coxae IV. Pedicel not clearly seen.

Sigilla: 3 pairs, posterior 0.55 diameter, ca. 2.21 lengths apart; ca.0.50 dist. from margin; middle 0.38 diameter, ca. 3.73 lengths apart; ca.0.09 dist. from the margin; anterior very small, marginal.

Leg: formula 4123. Coxae- Prolateral face of coxa with thin, long horizontally aligned setae above the coxal suture, below suture with numerous short, thick spike setae scattered in the distal half of the coxa. Leg lengths (ta, mt, ti, pa, fe, total): leg I 3.3, 5.0, 6.3, 5.4, 8.0, 28; leg II 3.1, 5.8, 6.2, 4.2, 7.8, 27.1; leg III 2.8, 4.9, 5.0, 4.0, 6.4, 23.1; leg IV 3.6, 7.3, 7.4, 4.1, 8.2, 30.6; palp 3.2, -, 5.6, 3.5, 5.2, 17.5. Midwidths (fe, ti): leg I 2.0, 2.0; leg II 2.0, 1.9; leg III 2.0, 1.7; leg IV 1.8, 1.8; palp 1.5, 2.0. Retrolateral face with thick, long bristles in anterior distal region. Spines- two spines each present on ventral tarsi of leg III & IV.

Figure 22. *Haploclastus montanus* **sp. nov.** paratype female BNHS SP-131: **A** dorsal carapace and abdomen; **B** ventral view showing sternum and abdomen. Scale bar = 10mm.

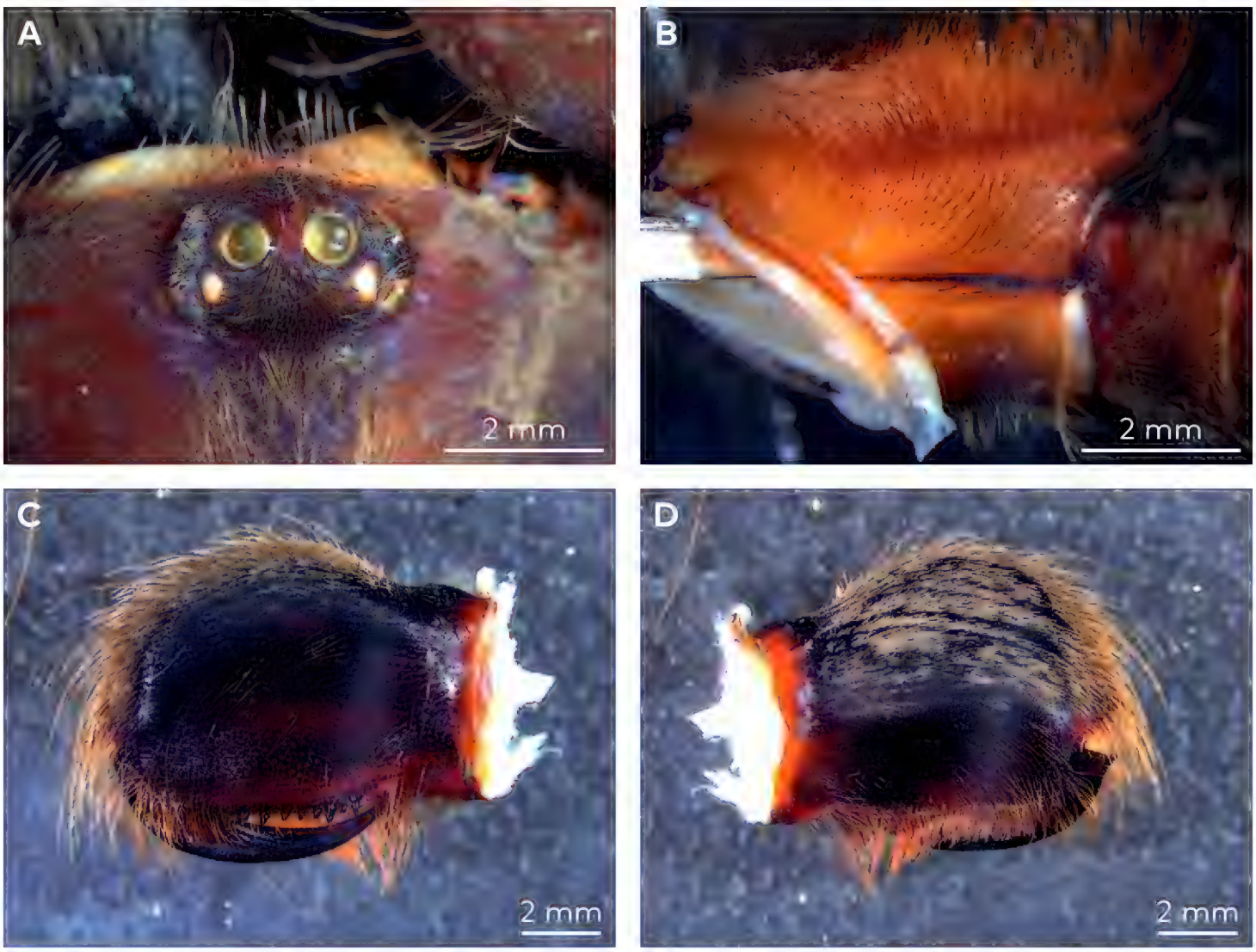

Figure 23. *Haploclastus montanus* **sp. nov.** paratype female BNHS SP-131: **A** eyes; **B** prolateral view of maxilla; **C** chelicerae prolateral view; **D** chelicerae retorlateral view.

Scopulae: thin, entire and undivided on tarsi I–IV; tarsi IV with 3–4 rows of spike setae in its basal half not dividing the scapulae. Metatarsi I–II entire; metatarsi III for ⅔ length, not divided; on metatarsi IV for ¼ of length divided by 3–4 rows of spike setae. Scopula well developed.

Tricobothria: tarsi I, 26 clavate and 28 long and short filiform in basal half in two rows; tarsi II, 26 clavate and 25 long and short filiform in distal half in two rows; tarsi III, 22 clavate and 20 long and short filiform; tarsi IV, 20 clavate and 24 long and short filiform; Palp tarsi with 40 clavate and 26 long and short filiform.

Claws: inferior tarsal claw present only on tarsi III & IV. Superior tarsal claws on all legs without dentition; single bare claw on palp.

Abdomen pilosity (Fig. 22A, 22B): cuticle not exposed dorsally and ventrally; dorsally covered with fine layer of brown long setae and bristles, many pallid; ventrally black with fine layer of many long black hair bristles.

Spinnerets: 2 pairs, blackish brown, covered with black hair.

Spermethecae (Fig. 21C): two seminal receptacles in shape of an elongate semicircles, meeting at their inner ends.

Natural history and distribution: The male holotype along with another male and a female were found on a single dead rotten tree in a shola patch in Eravikulam National Park, Kerala (Fig. 16, Table 1). The type locality is characterized by high elevation montane grassland and shola forests. The burrow of these spiders extended to about one and a half foot with a bulb like chamber. Several burrows were found on trees but could not be collected. The species also occurs in tea estates around the national park and also in Munnar town. The species is arboreal in shola patches however it is seen on the ground in tea estates at the base of tea bush. A single female was observed with hatchlings.

***Haploclastus nilgirinus* Pocock, 1899**
(Figs 24–25, Table 1)

Type specimen: female NHM 94.8.21.9, from Nilgiri hills, Tamil Nadu, India.

Diagnosis: A large sized spider reaching a total length of 52mm. Overall in shade of brown, carapace with a thick mat of golden setae and legs dark brown to black.

Figure 24. *Haploclastus nilgirinus* adult female in life.

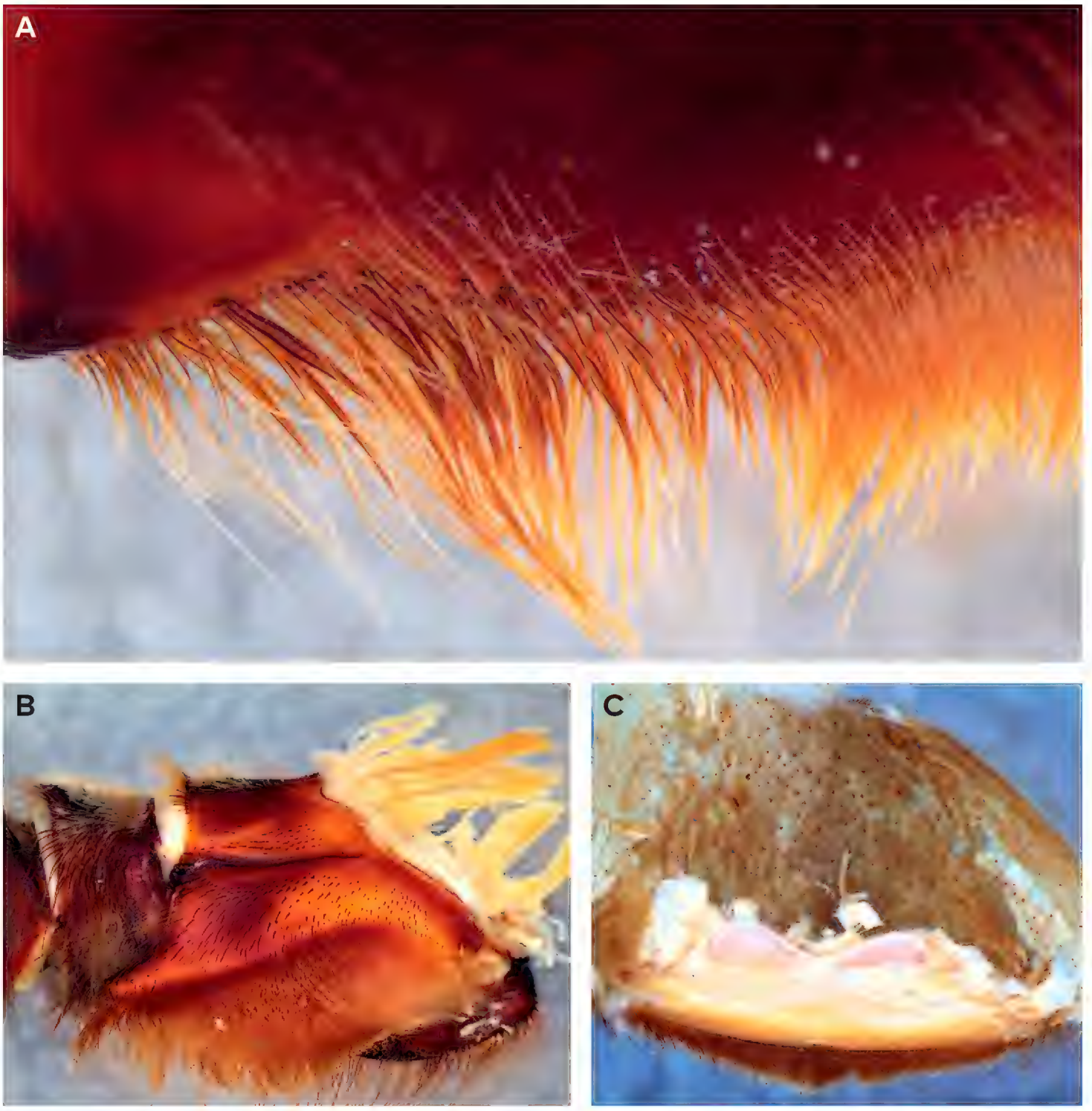

Figure 25. *Haploclastus nilgirinus* adult female type NHM 94.8.21.9: **A** chelicerae retrolateral basal region; **B** prolateral face of maxilla; **C** spermathecae.

Anterior maxillary lobe distinctly pronounced into a tubular cone with a basal constriction. Spermathecae in shape of two semi-circular low mounds.

***Haploclastus tenebrosus* Gravely, 1935**
(Fig. 26)

Type specimen: male, ZSIK, not traceable.

Diagnosis: Dark brown overall with posterior pair of legs slightly paler. The palp bulb is short and stocky, the embolus tapers gradually terminating into a flat, bifid duck's bill sructure directed downwards, bearing a keels (Fig. 26).

Comments: A search made for the specimen in the collection of the Zoological Survey of India, Kolkata did not turn fruitful. The jar with the label *Haploclastus tenebrosus* and *Haploclastus kayi* (=*C. kayi* **comb. nov.**) has only a single immature type of *C. kayi* **comb. nov.** and the male holotype of *H. tenebrosus* is missing.

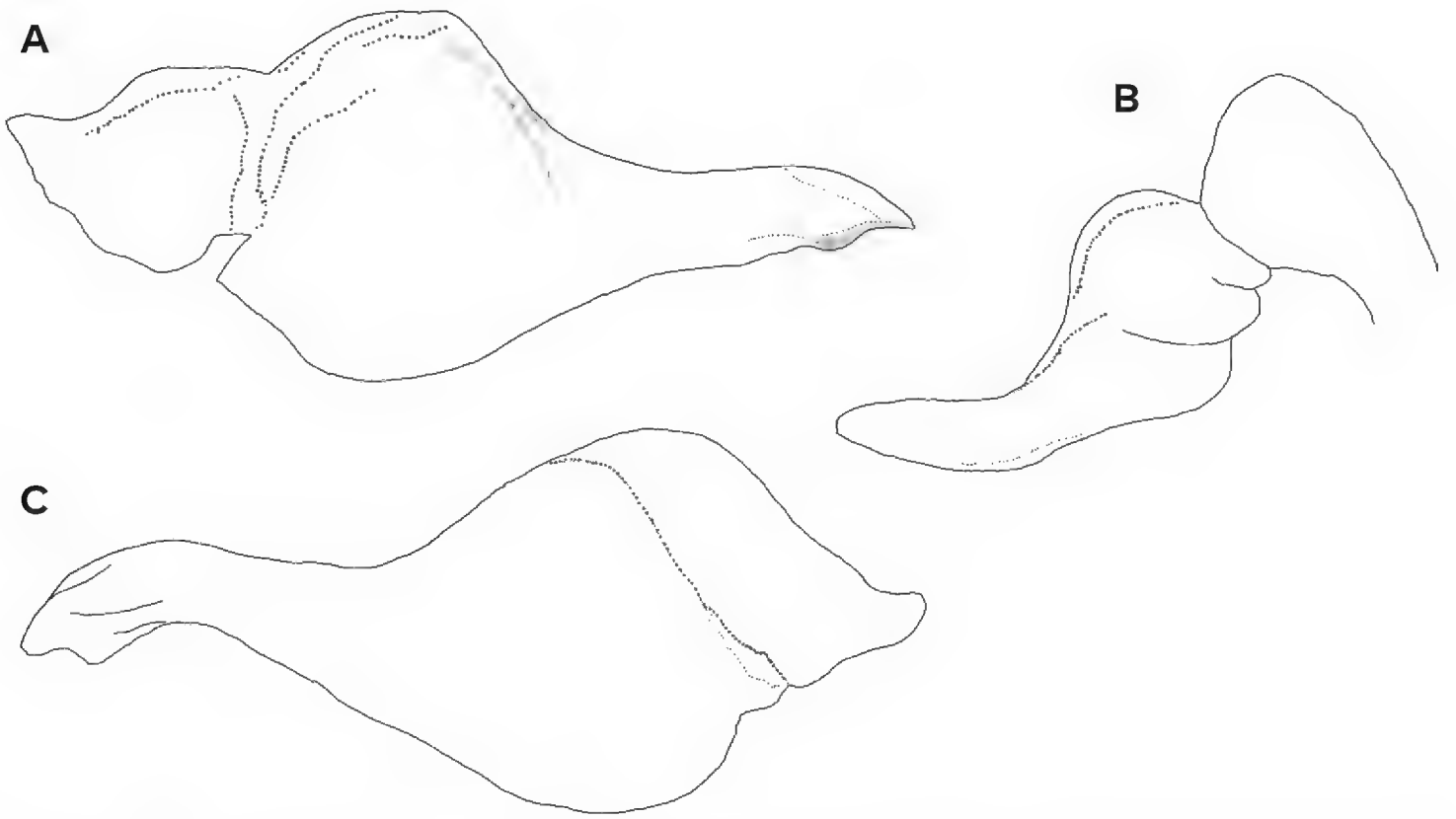

Figure 26. *Haploclastus tenebrosus* palp bulb of holotype male. Redrawn from sketch provided by Andrew Smith.

***Haploclastus ajithii* sp. nov.**
LSID: urn:lsid:zoobank.org:act:683FE646-C309-4EA0-A74A-165FBB2C404D
(Figs 27–30, Table 1)

Holotype: female BNHS SP 132, Valparai, Tamil Nadu state, India (1010.359058°, 76.982951°, elevation 1134m), collected by Rajesh Sanap and Zeeshan Mirza on 22nd December 2013. Paratype: 1 female BNHS SP 133, same data as holotype.

Etymology: The specific epithet is a patronym honoring Dr. Ajith Kumar of Wildlife Conservation Society, India for his support and encouragement to the author.

Diagnosis: Fovea deep, strongly procurved. Posterior sterna sigilla deep and remote from sternal margin. Chelicerae with one row of teeth. Scopulae on palp tarsi divided by thick long setae. Retrolaeral face of chelicerae with spike setae on basal oral grove. Prolateral face of maxilla with stout long bristles arranged below and above the maxillary suture in a diffused manner. Inferior tarsal claw present only on tarsi III. Spermathecae with two independent receptacles in shape of balloons.

Description of holotype female BNHS SP 132 (Fig. 27): carapace 11.0 long, 8.0 wide (L/W ration 1.4), chelicerae 7.14 long. Sternum 4.8 long, 3.9 wide (L/W 1.2). Abdomen 14.1 long, 9.5 wide (L/W 1.5). Spinnerets: PMS, 1.1 long, 0.6 wide, 0.5 apart; PLS, 2.0 basal, 1.2 middle, 1.7 distal; midwidths 1.3, 1.2, 1.0 respectively.

Figure 27. *Haploclastus ajithii* **sp. nov.** female holotype in life.

Figure 28. *Haploclastus ajithii* **sp. nov.** holotype female BNHS SP-132: **A** dorsal carapace and abdomen; **B** ventral view showing sternum and abdomen. Scale bar = 10mm.

Colouration (Figs 27, 28): overall in a shade of brown, with extremities of leg with a tinge of light brown. Carapace blackish brown, abdomen dark brown. Colouration in preservative is more faded and is in a shade of brown to reddish brown.

Carapace (Fig. 28A): covered with short brown setae overall, a clear band lacking setae on each side of caput. Fovea procured, deep. A few long bristles present on the ocular tubercle. A band of bristles present posterior to the ocular tubercle upto the fovea and short ones scattered throughout the carapace.

Eyes (Fig. 29A): ratio of ocular quadrant width to length 1.3. PME smaller than PLE, ALE & AME equal and larger than the rest. Eye diameter: ALE, 0.3; AME, 0.3; PLE, 0.2; PME, 0.1. Distance between the eyes: AME-AME, 0.2; PME-PLE, 0.1; AME-ALE, 0.1; PME-PME, 0.7; ALE-PLE, 0.1. Ocular quadrate, 1.6 long, 2.0 wide. MOQ: length, 0.4; front width, 0.8; back width, 1.2.

Maxilla (Figs 29B, 30B): front length 3.6, back length 3.9 and 2.4 wide. Posterior ventral edge gently rounded and long; retrolateral face yellowish-red, smooth,

glabrous. Cuspules: <120 in anterior corner in roughly triangular region. Posterior edge almost straight, concave near heel. Thick spike setae in 2–3 rows present above the maxillary suture aligned along the suture; below the suture with thick long spike setae scattered in distal half of the prolateral face, not in a defined 'C' pattern.

Labium: 1.6 long, 2.4 wide with <80 cuspules in band on apical border of labium; cuspules ca. similar in size to maxillary. Basal groove shallow, distinct with two distinct mounds.

Chelicera (Figs 29C, 29D, 30A): inter-cheliceral peg setae absent. Basal oral fringe of chelicerae lacking a cluster of thick long curved setae. Thick modified setae intermixed with normal setae on basal half of oral fringe on retrolateral aspect. Promarginal teeth 14 and 16 basosomal teeth (Figs 29 C–D).

Sternum (Fig. 28B): longer than wide, high in centre, slopping gradually, covered with a mat of short brown and long, black setae. Posterior edge pointed but not separating coxae IV. Pedicel not clearly seen.

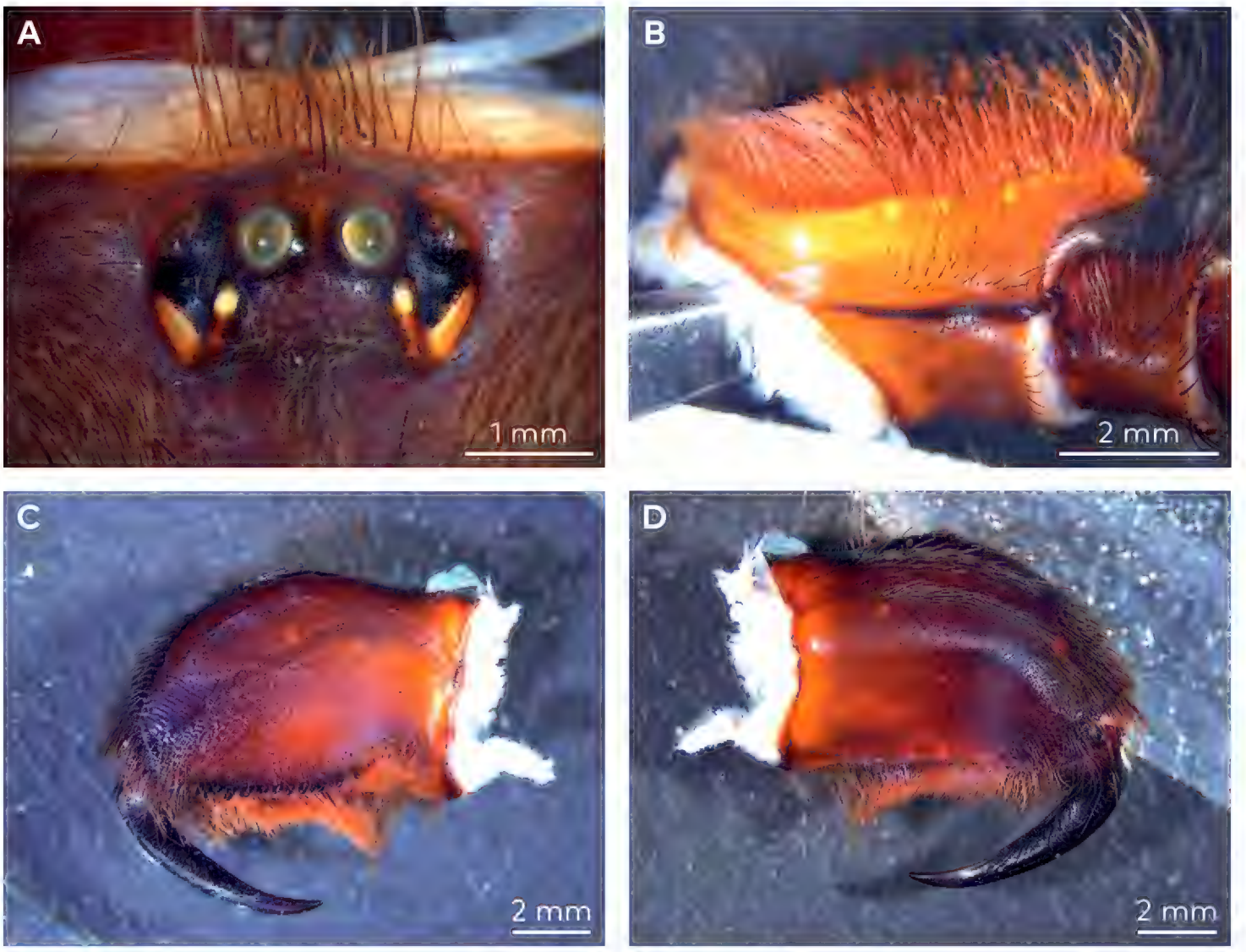

Figure 29. *Haploclastus ajithii* **sp. nov.** holotype female BNHS SP-132: **A** eyes; **B** prolateral view of maxilla; **C** chelicerae prolateral view; **D** chelicerae retorlateral view.

Sigilla: 3 pairs, posterior 0.49 diameter, ca. 1.38 lengths apart, ca.0.71 dist. from margin; middle 0.35 diameter, ca. 3.11 lengths apart, marginal; anterior 0.31, 3.68 lengths apart, marginal.

Leg: formula 4123. Coxae- Prolateral face of coxa with thin, long horizontally aligned setae above the coxal suture, below suture with numerous short, thick spike setae scattered in the distal half of the coxa. Leg lengths (ta, mt, ti, pa, fe, total): leg I 3.0, 4.1, 5.5, 4.7, 7.4, 24.7; leg II 2.7, 3.2, 3.8, 4.0, 6.3, 20.0; leg III 2.4, 3.3, 2.9, 3.2, 4.9, 16.6; leg IV 3.0, 4.9, 6.3, 4.3, 7.0, 25.3; palp 3.1, -, 3.6, 3.2, 4.9, 14.8. Midwidths (fe, ti): leg I 1.2, 1.5; leg II 1.5, 1.5; leg III 2.0, 1.5; leg IV 1.5, 1.7; palp 1.2, 1.6. Retrolateral face with thick, long bristles in anterior distal region. Spines- spines present on metatarsi of leg III & IV. Leg III mt, p 1, r 1, v 3, d 1; leg IV mt, p 1, r 1, v 3, d 1.

Scopulae: thin, entire and undivided on tarsi I–II and metatarsi I–II; metatarsi III for ⅔ length, not divided; on metatarsi IV for ¼ of length. Tarsi III–IV divided by 5–6 slender spike setae. Scopula thin in comparison with other members of the subfamily.

Tricobothria: tarsi I, 10 clavate and 12–13 long and short filiform in basal half in two rows; tarsi II, 18–19 clavate and 20–21 long and short filiform in distal half in two rows; tarsi III, 15–16 clavate and 10–11 long and short filiform; tarsi IV, 15–16 clavate and 13–14 long and short filiform; Palp tarsi with 19–20 clavate and 7–8 long and short filiform.

Claws: inferior tarsal claw present only on tarsi III. Superior tarsal claws on all legs without dentition; single bare claw on palp.

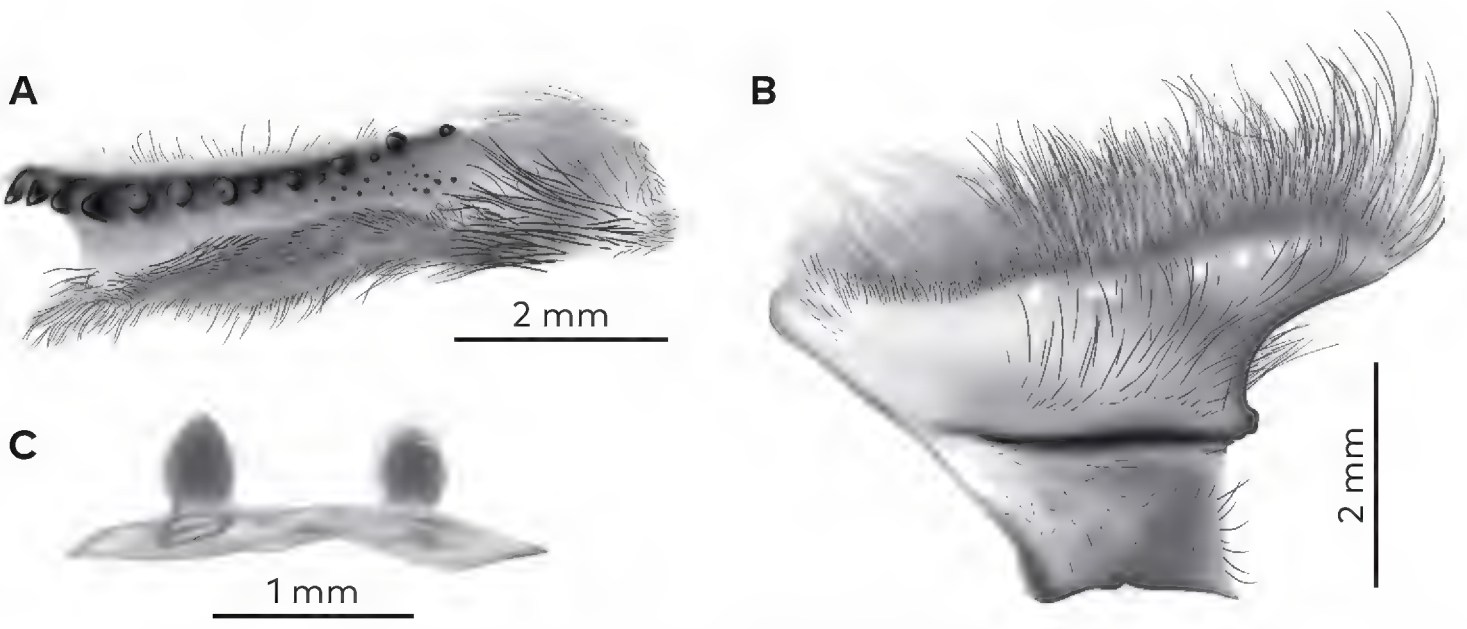

Figure 30. *Haploclastus ajithii* **sp. nov.** holotype female BNHS SP-132: **A** chelicerae ventral view; **B** prolateral view of maxilla; **C** spermathecae. Sketch by Hrishikesh Hardikar.

Abdomen pilosity (Fig. 28A, B)**:** cuticle not exposed dorsally and ventrally; dorsally covered with fine layer of dark brown setae intermixed with long pallid setae; ventrally light brown mat of setae.

Spinnerets: 2 pairs, blackish brown, covered with black hair.

Spermethecae (Fig. 30C): tow seminal receptacles in shape of a balloon with distinct constriction at base.

Natural history and distribution: The type series was collected along the road on the way to Valparai town, Tamil Nadu state (Fig. 16, Table 1). Valparai is largely degraded with a few isolated patches of evergreen shola patches where the spiders occur. The burrows of the spiders were lined with thick layer of web and were about a foot deep horizontally oriented on the mud cliffs. One of the female paratypes was found with an egg sac and another paratype female was found with hatchlings. Burrows of this species are concentrated in suitable patches as more than 15 burrows of this species were observed in stretch of three meters.

***Haploclastus validus* (Pocock, 1899)**
Phlogiodes validus Pocock, 1899: 748; Pocock, 1900: 179, Mirza & Sanap, 2013: 18
Phlogiodes robustus Pocock, 1899: 748; Pocock, 1900: 179
Haploclastus validus Raven, 1985: 157; Mirza et al., 2011: 2110
(Figs 31–33, Table 1)

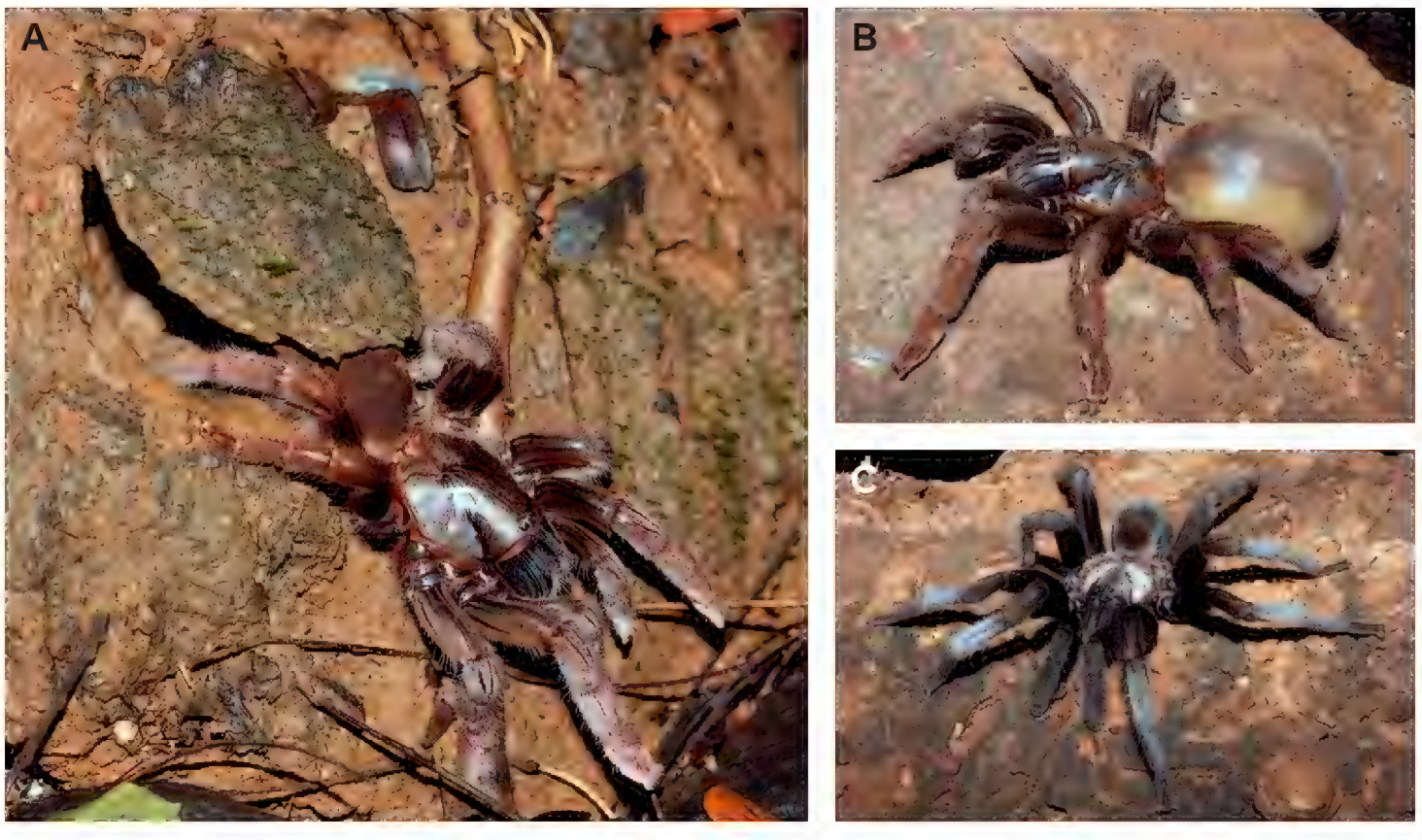

Figure 31. *Haploclastus validus* in life: **A–B** adult female, **C** male.

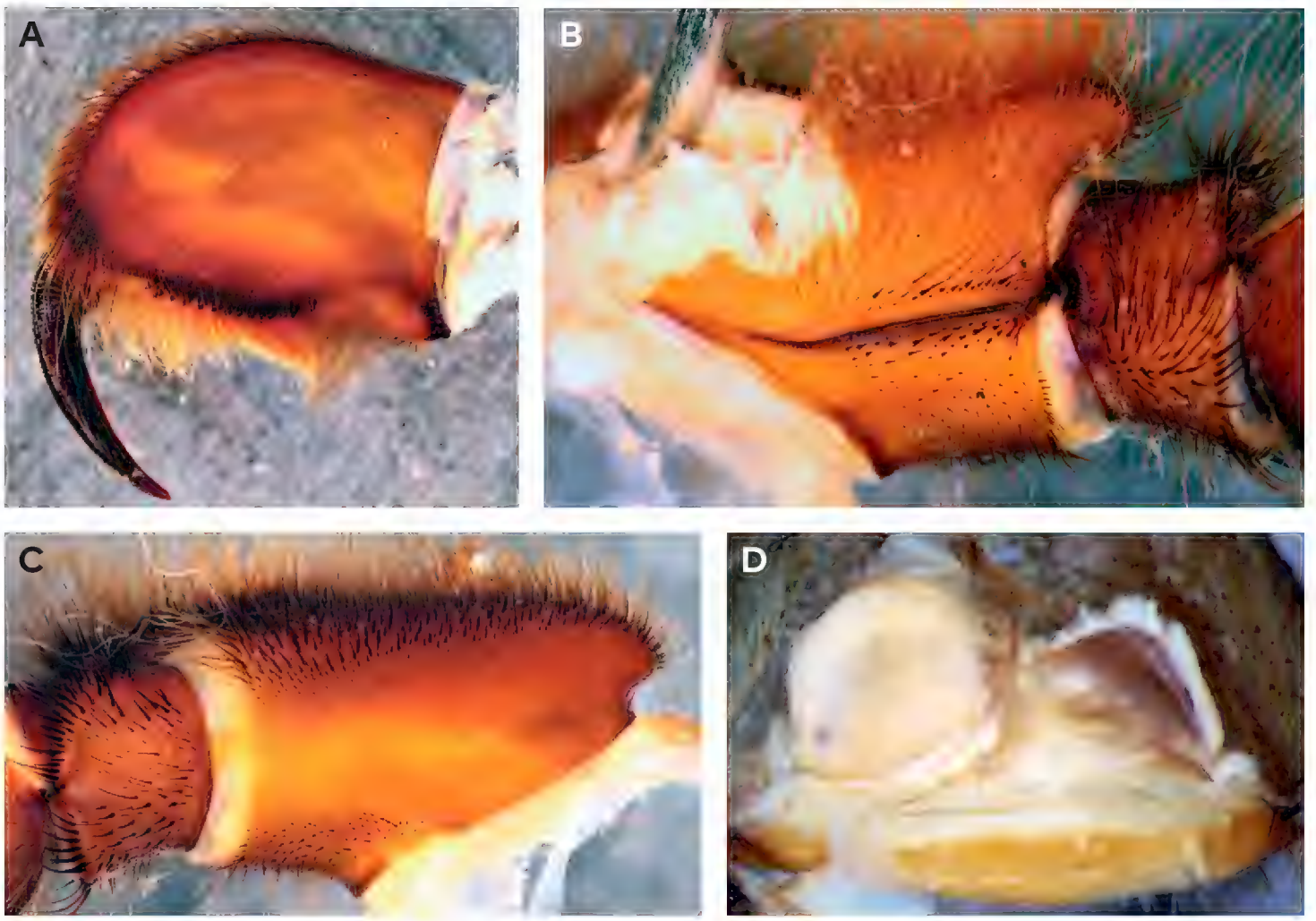

Figure 32. *Haploclastus validus* female type NHM: **A** prolateral view of chelicerae; **B** prolateral face of maxilla; **C** retrolateral caxa of leg; **D** spermathecae.

Remark: See Mirza et al. (2011) and Mirza & Sanap (2013) for detailed description and diagnosis. See Fig. 33 for the distribution of the species.

***Thrigmopoeus* Pocock, 1899**
Thrigmopoeus Pocock, 1899: 747; Gravely, 1935: 81
Haploclastus Prasanth and Sunil Jose, 2014: 494 (in part)

Type species: *Thrigmopoeus insigni*s Pocock, 1899

Species included: *Thrigmopoeus insignis, Thrigmopoeus truculentus*

Diagnosis: Fovea shallow, procurved. Posterior sterna sigilla not very deep and posterior sigilla sub-centrally placed. Retrolaeral face of chelicerae with parallel rows of thick curved modified setae. Prolateral face of maxilla with stout thorns and long black bristles arranged in a well-defined "C" shaped band below the maxillary suture. Spines present on legs III–IV. Spermathecae in shape of mounds. Females hang egg sac in a hammock in the burrow.

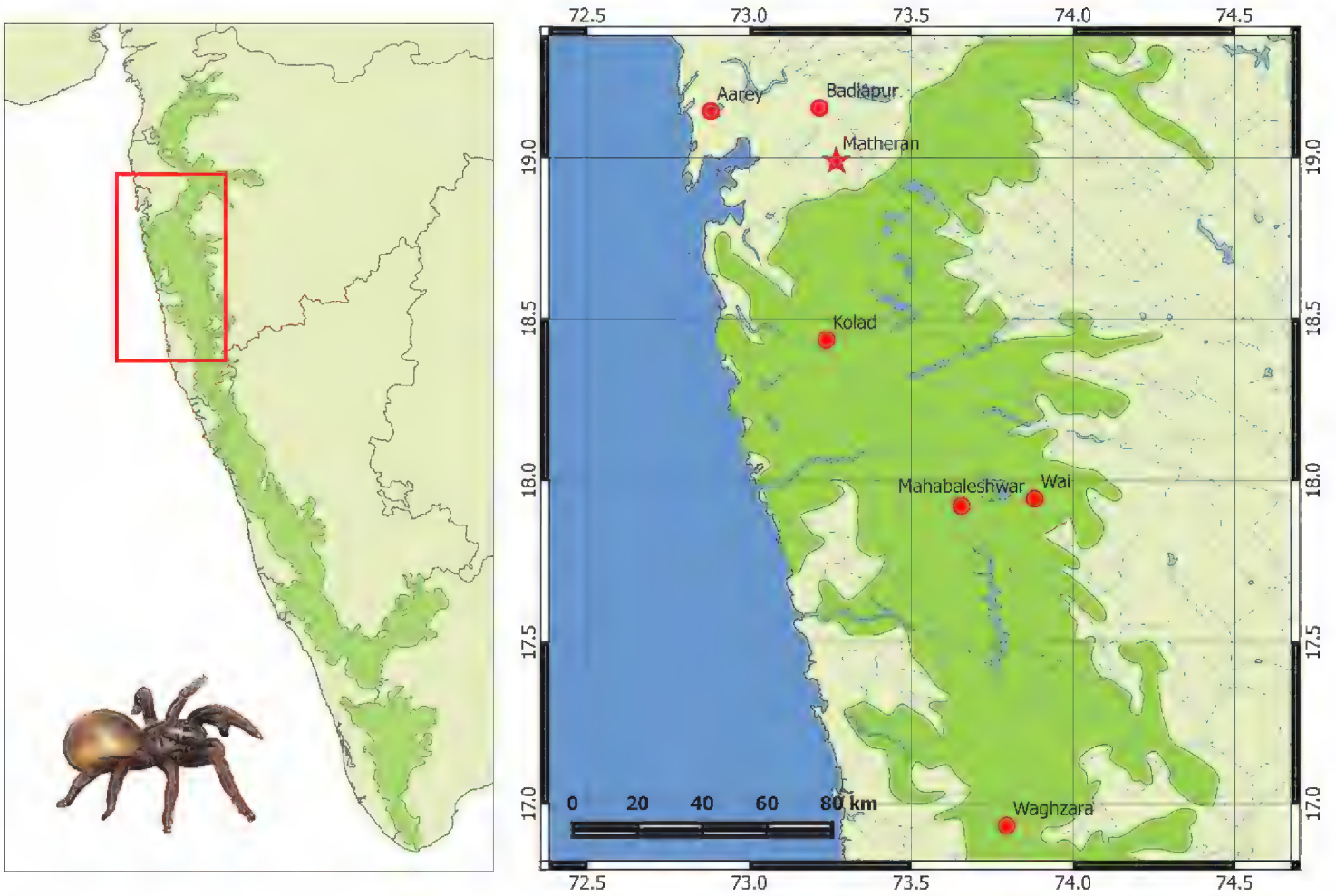

Figure 33. Distribution map of *Haploclastus validus*.

Description: Large sized spiders 25–45. Carapace ovate, hirsute, with two clear (setae-less) bands on both sides of the caput. Caput low in females. Fovea procurved in adults, not straight, recurved in juveniles. Small granules scattered on the carapace, evident clearly posterior to the fovea. Eye group sub-quadrate to wider than long, ocular tubercle well defined. Clypeus narrow. Chelicerae normal, with 10–11 teeth on promargin of furrow, basomesally 26–55 small teeth. Labium wider than long. Labiosternal grove with two distinct mounds. Cuspules 170–200 in the sub-apical region of the labium. Maxillae longer than wide, overall setose, prolateral anterior angle distinctly produced, 150–200 cuspules distributed along proximal prolateral angle. Serrula absent. Sternum as long as wide, sigilla small oval, submarginal, posterior sigilla sub-centrally placed, not deep. Prolateral face of maxilla in females with stout thorns arranged below and above maxillary suture, those below the suture arranged in a 'C' shaped manner. Legs moderately stout, hirsute, spines present on leg II–IV. Abdomen hirsute, without pattern. PMS well-developed; PLS, apical segment digitiform. Spermathecae with two individual receptacles in shape of mounds. Male palp bulb short, embolus tapers into a stout scoop like structure with a few ventral keels.

Key to the genus *Thrigmopoeus*

1 – Fovea larger than or equal to ocular quadrant width ..... *T. insignis*
– Fovea smaller than ocular quadrant width ..... *T. truculentus*

***Thrigmopoeus insignis* Pocock, 1899**
(Figs 34–35, 40, Table 1)

Type specimen: female, NHM 1899.7.10.13, Kanara Ghats, Karnataka, India.

Diagnosis: A large sized spider reaching 55mm and larger in total length. Fovea larger than ocular quadrant. Chelicerae with 15 promarginal teeth. Anterior maxillary lobe distinctly pronounced into a tubular cone lacking a distinct constriction at base. Spermathecae with two independent elongate mounds.

Figure 34. *Thrigmopoeus insignis* adult female in life.

Figure 35. *Thrigmopoeus insignis* female type NHM 1899.7.10.13: **A** prolateral view of chelicerae; **B** prolateral face of maxilla; **C** spermathecae.

Thrigmopoeus truculentus Pocock 1899

(Figs 36–38, Table 1)

Type specimen: female NHM 98.12.92, Karwar, Karnataka, India

Referred material: female BNHS SP 134, Sirendri, Silent Valley National Park, Kerala state, India (11.092725°, 76.446181°, elevation 1023m), collected by Rajesh Sanap and Zeeshan Mirza on 23rd January 2014, female BNHS SP 135; female BNHS SP 136, Wayanad Wildlife Sanctuary, Kerala state, India (11.839531°, 76.050154°, elevation

Figure 36. *Thrigmopoeus truculentus:* **A** female BNHS SP-134; **B** in life.

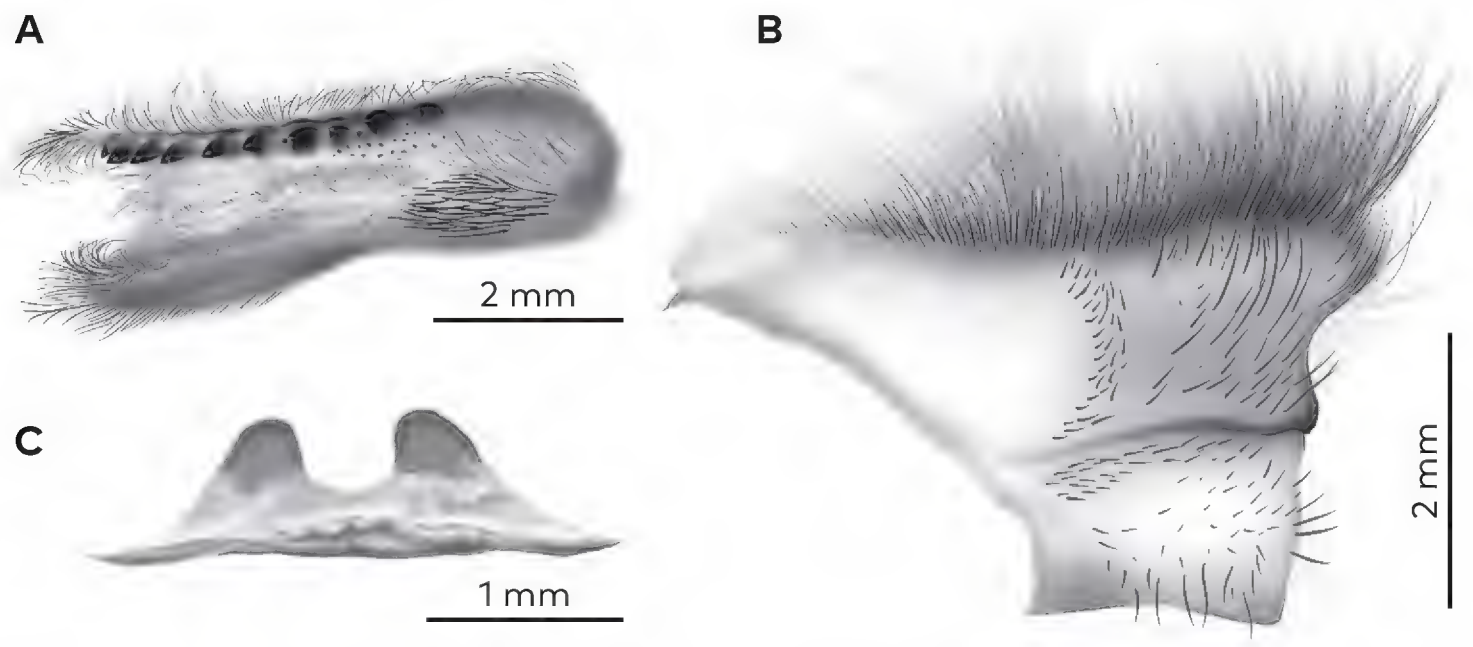

Figure 37. *Thrigmopoeus truculentus* female BNHS SP-134: **A** chelicerae ventral view; **B** prolateral view of maxilla; **C** spermathecae. Sketch by Hrishikesh Hardikar.

785m), collected by Rajesh Sanap and Zeeshan Mirza on 28rd January 2014, female BNHS SP 137.

Diagnosis: A medium sized species reaching an average length of 29mm. Overall in shade of brown with two distinct black bands radiating from the fovea along the caput. Fovea smaller than ocular quadrant width. Anterior maxillary lobe moderately pronounced, tapering into a short cone lacking a basal constriction. Spermathecae in shape of two independent mounds.

Natural history: The species is common along roads in Wayanad Wildlife Sanctuary in Kerala state (Fig. 39, Table 1). The spiders were collected from deciduous forest. The burrows were about 1–1.5 feet deep and were made on bud embankments along

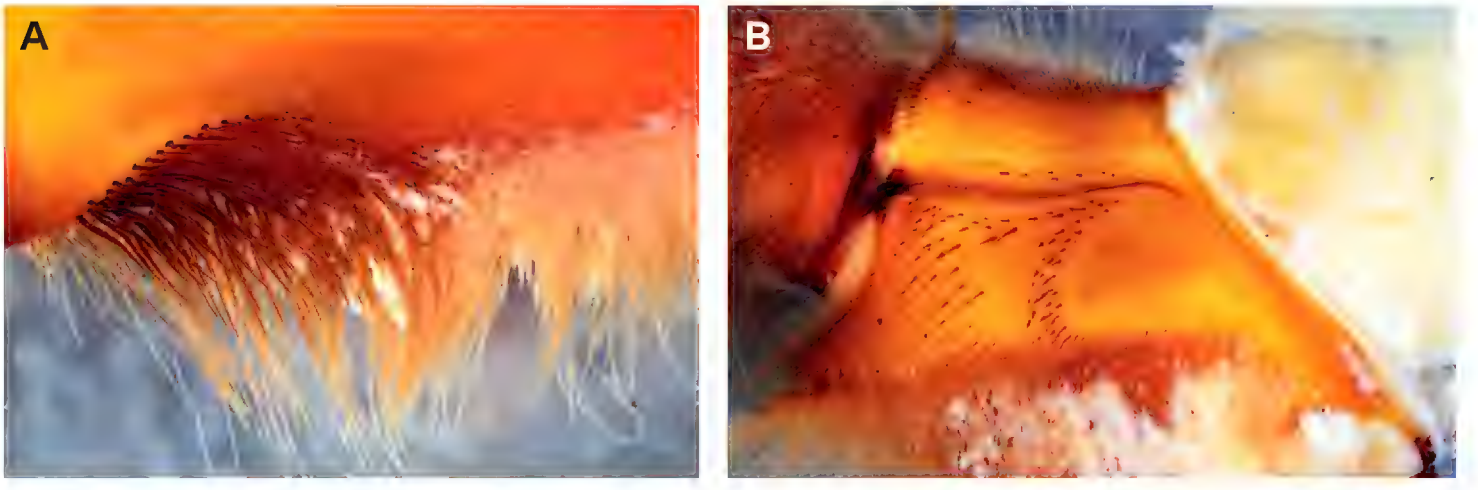

Figure 38. *Thrigmopoeus truculentus* female NHM 98.12.92: **A** prolateral basal region of chelicerae; **B** prolateral face of maxilla.

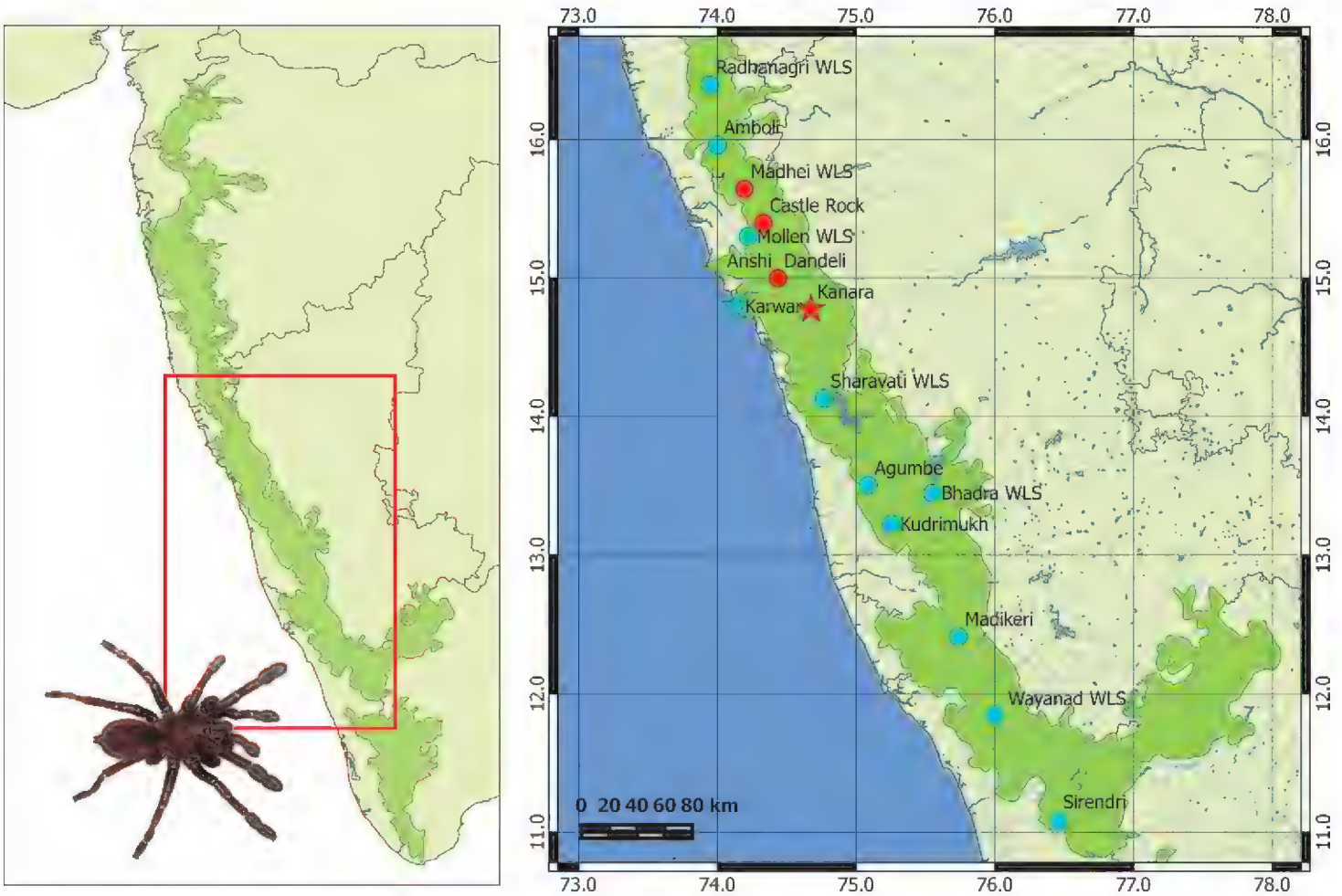

Figure 39. Distribution map for species of the genus *Thrigmopoeus*. Star indicate type localities and circles indicate additional localities. Colour (**blue**) *Thrigmopoeus truculentus*, (**red**) *Thrigmopoeus insignis*.

road and forest pathways. Two females were found with an egg sac each in their burrow which were hung in a hammock made up of web from the roof of the burrow. The specimens from Sirendri were found alonw a forest trail along a stream in an evergreen forest. The species was not common at this locality.

Comments: The species appears to be patchy in its distribution and individuals from Wayanad and Silent Valley National Park exhibit substantial morphological differences from the population from northern Karnataka suggesting that this may be a species complex.

Discussion

The classification of mygalomorph spiders, particularly within the Theraphosidae family, has been a topic of uncertainty for some time. Previous studies by Raven (1985), Bond et al. (2012), and Guadanucci (2014) have shed some light on the subject. However, Bond et al.'s (2012) study only focused on two genera of theraphosid spiders, while Raven's (1985) study remains strong. Thrigmopoeinae, a subfamily within Theraphosidae, has not received much attention in terms of taxonomic revision, except for a generic revision by Raven (1985) that had limitations. Recently, Lüddecke

et al. (2018) presented a more comprehensive dataset on ten theraphosid subfamilies, while Foley et al. (2021) assessed relationships based on transcriptomic data. However, both studies only included a single representative of Thrigmopoeinae. The present work includes data from both type specimens and fresh material of new and known taxa, which sets the stage for molecular studies to test the monophyly of the subfamily, the existing and newly described taxa. The genus *Haploclastus* shows a high degree of morphological divergence across species and may be paraphyletic in nature. Furthermore, the morphological difference across populations of *Thrigmopoeus truculentus* suggests the presence of cryptic species across its broad range.

The lack of reliable fossil records of theraphosid spiders is a major hindrance in elucidating the evolution, dispersal and diversification of theraphosid spiders. Based on data presented by Foley et al. (2021), Thrigmopoeinae was recovered as sister to Selenocosmiinae and shared a common ancestor around the Late Cretaceous (99–95 Million Years Ago), highlighting a potential Gondwanan origin. A molecular phylogeny of Thrigmopoeinae incorporating all known members of the subfamily will help elucidate the temporal diversification within the subfamily and assess the validity of taxa described herein.

The present study brings the total number of species of the Western Ghats endemic subfamily to twelve, suggesting that the diversity was grossly underestimated. Four new species of Indian tarantulas have been added to the list with little effort in point sampling, and it is likely that the number will increase with more intensive sampling. The present study included sampling in only four states and only a single locality in the state of Tamil Nadu. Dedicated efforts in the state of Tamil Nadu will likely yield more species of Thrigmopoeinae and also rediscovery of *Haploclastus* species (namely *H. cervinus* and *H. tenebrosus*. Based on the present study, which was limited to morphological data and lacked support of molecular data, I attribute known and new species to the two known and one new genus. I suggest regarding the work preliminary, and a baseline for a more exhaustive revision with molecular data. The Thrigmopoeinae, with its diverse and endemic nature, is an ideal taxa for exploring diversification patterns across the Western Ghats. Additionally, this group represents a flagship for invertebrate conservation as they are large-bodied and are keystone species inhabiting primary forests across the Western Ghats. The description of four new species of tarantulas is from protected wildlife areas with a high level of protection for these species, especially from habitat loss. However, the newly described species will be threatened by illegal collectors for the pet trade. Despite stringent laws in India, many Indian species that were described in the last decade have been collected from the wild, and the species are on sale in several international pet stores. It is hoped that more efforts are brought into place to curb illegal collection for the trade of wild species and their sale.

Acknowledgements

Special thanks to the Forest Department of Kerala, Karnataka and Tamil Nadu for issuing necessary permits to conduct the present study. Fieldwork would not have been possible without the help of the following people by providing advice, logistics and assistance: Rajesh Sanap, Saunak Pal, Nilesh Mane, Harshal Bhosale, Shardul Bajikar, Devvavrat Joshi, Varun Vaze, Nirmal Kulkarni, Atish Gawai, Ashish Jadhav, S. M. Maqsood Javed, Aravind S., Mohan Kumar, Sreedhar V. The following institutions/organizations extended valuable support to the tarantula project: Natural History Museum (UK), Bombay Natural History Society (India), Nature Conservation Foundation (India), National Centre for Biological Sciences (India), Sanctuary Asia (India), Aagumbe Rainforest Research Station (India), Singinawa Conseration Foundation (India), Foundation for Ecological Research and Advocacy (FERAL, India). Rajesh Sanap helped with fieldwork, data collection and museum visit. Special thanks to Hrishikesh Hardikar for preparing the illustrations of all the species. Andrew Smith for sharing sketches of types examined by him. Analysis and manuscript revision was supported by the Max Planck Society's IMPRS 'From Molecules to Organisms' program. Visit to the natural history museums was supported by a generous grant from the Newby Trust Limited and Infosys Travel Award. Fieldwork was supported by two generous grants from the Rufford Foundation and funding from the Singinawa Conservation Foundation. I am grateful to several reviewers who reviewed older and the final versions of the manuscript from which the ms greatly benefited.

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